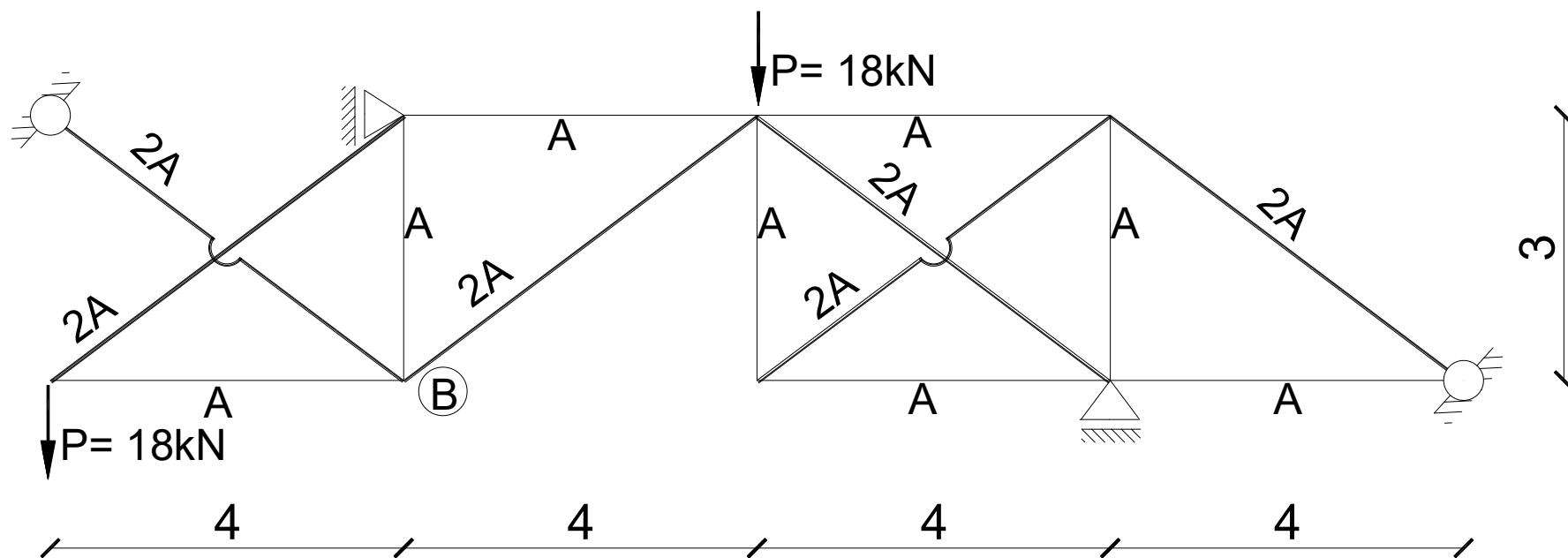
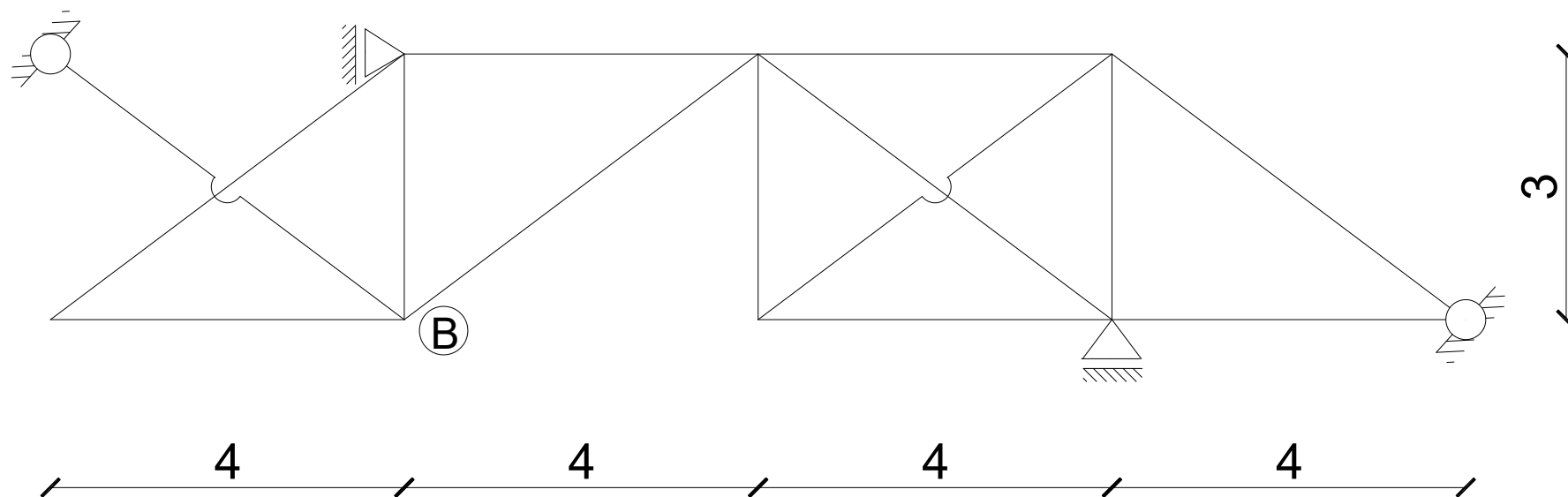
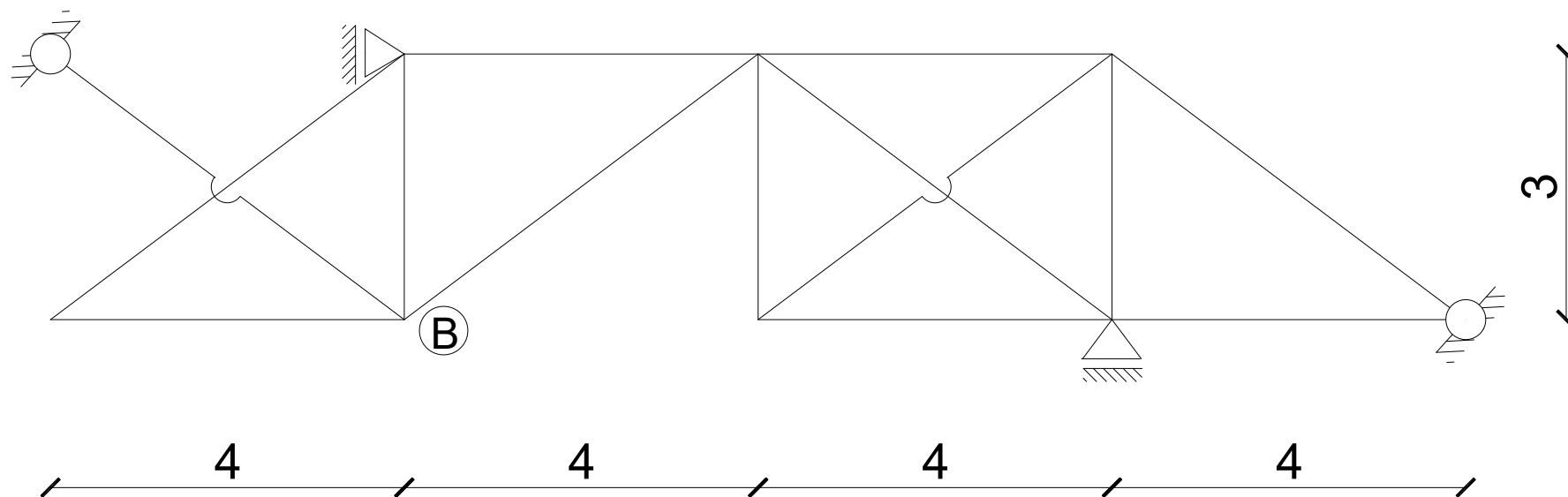


Zadanie: Narysuj wykres sił normalnych dla zadanej kratownicy i policz przemieszczenie pionowe węzła B. Zadanie rozwiąż metodą sił.





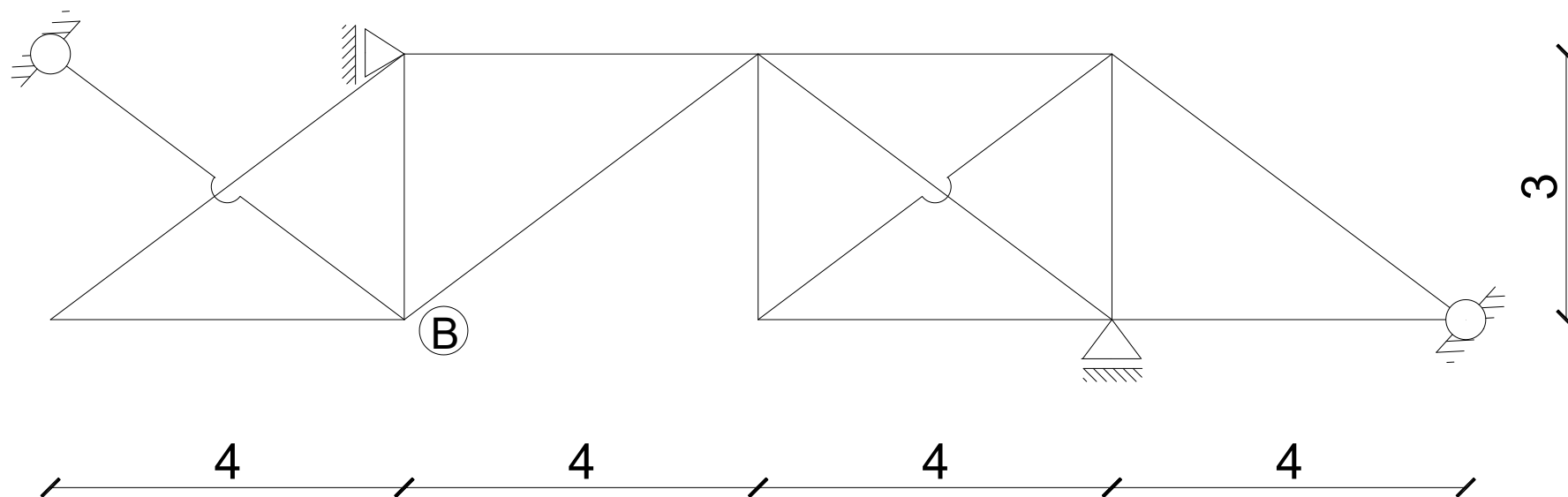
Stopień statycznej niewyznaczalności:



Stopień statycznej niewyznaczalności:

$$n_s = l_r + l_{pr} - 2 \cdot w$$

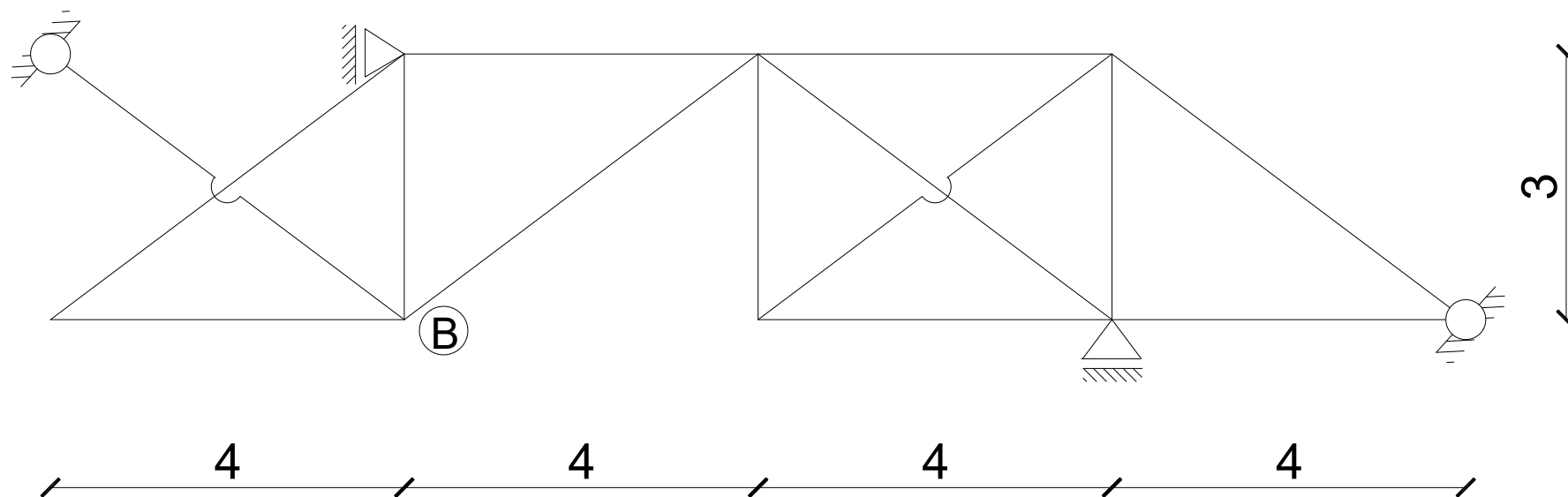
dr inż. Hanna Weber



Stopień statycznej niewyznaczalności:

$$n_s = l_r + l_{pr} - 2 \cdot w = 6$$

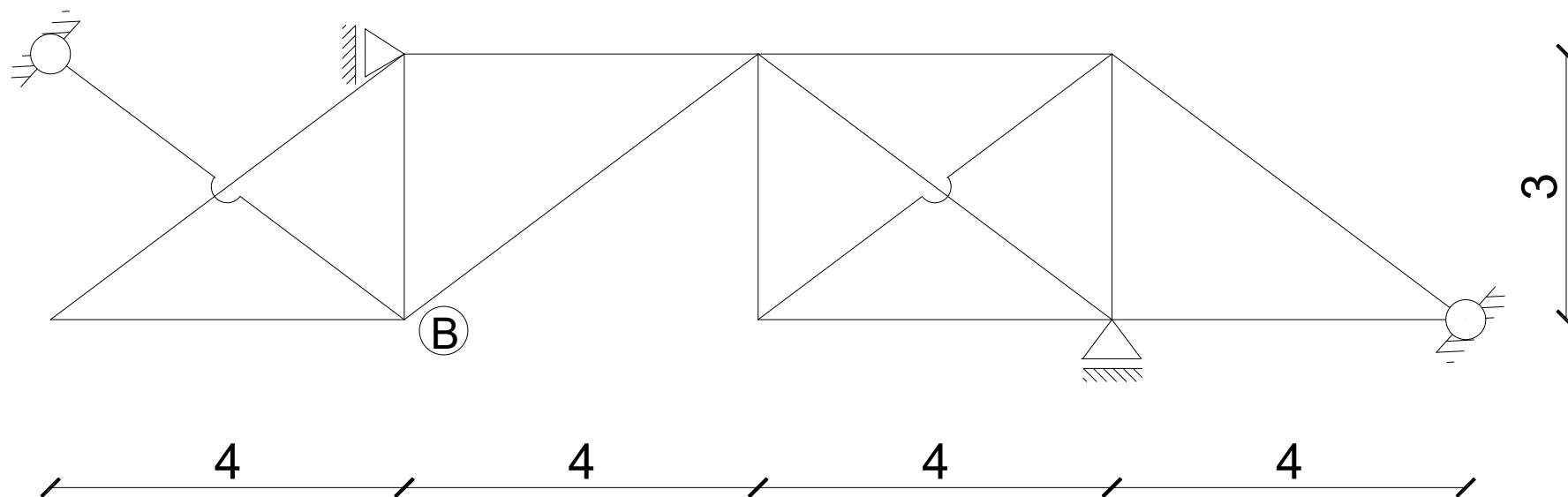
dr inż. Hanna Weber



Stopień statycznej niewyznaczalności:

$$n_s = l_r + l_{pr} - 2 \cdot w = 6 + 14$$

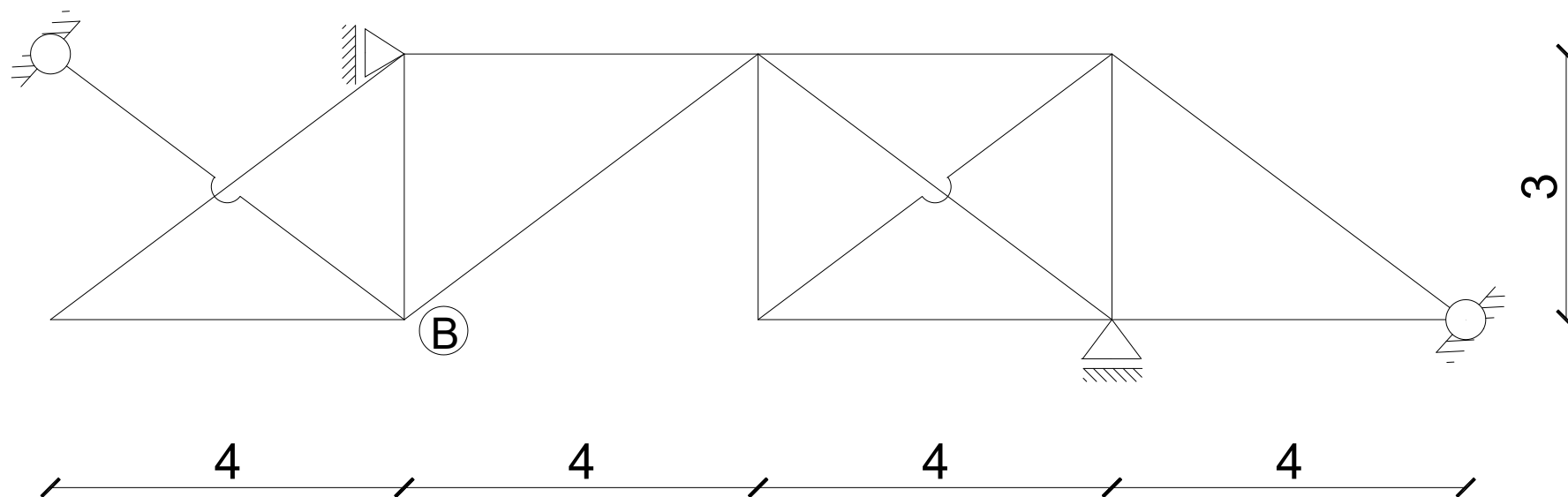
dr inż. Hanna Weber



Stopień statycznej niewyznaczalności:

$$n_s = l_r + l_{pr} - 2 \cdot w = 6 + 14 - 2 \cdot 9$$

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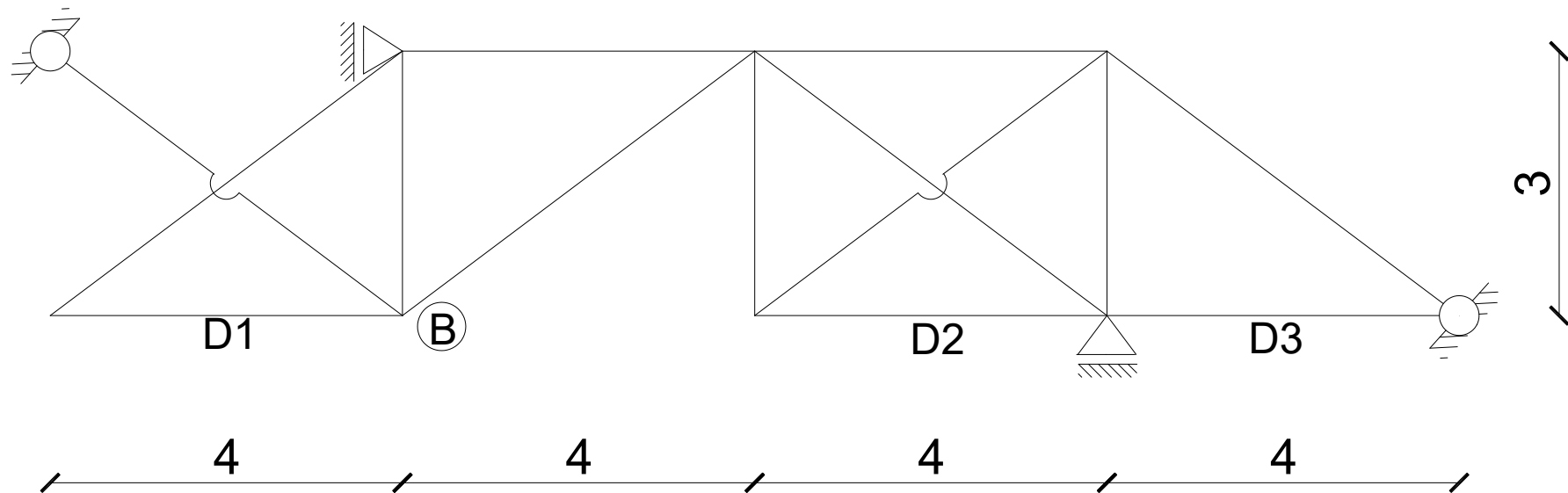


Stopień statycznej niewyznaczalności:

$$n_s = l_r + l_{pr} - 2 \cdot w = 6 + 14 - 2 \cdot 9 = 2$$

dr inż. Hanna Weber

Oznaczenie prętów:

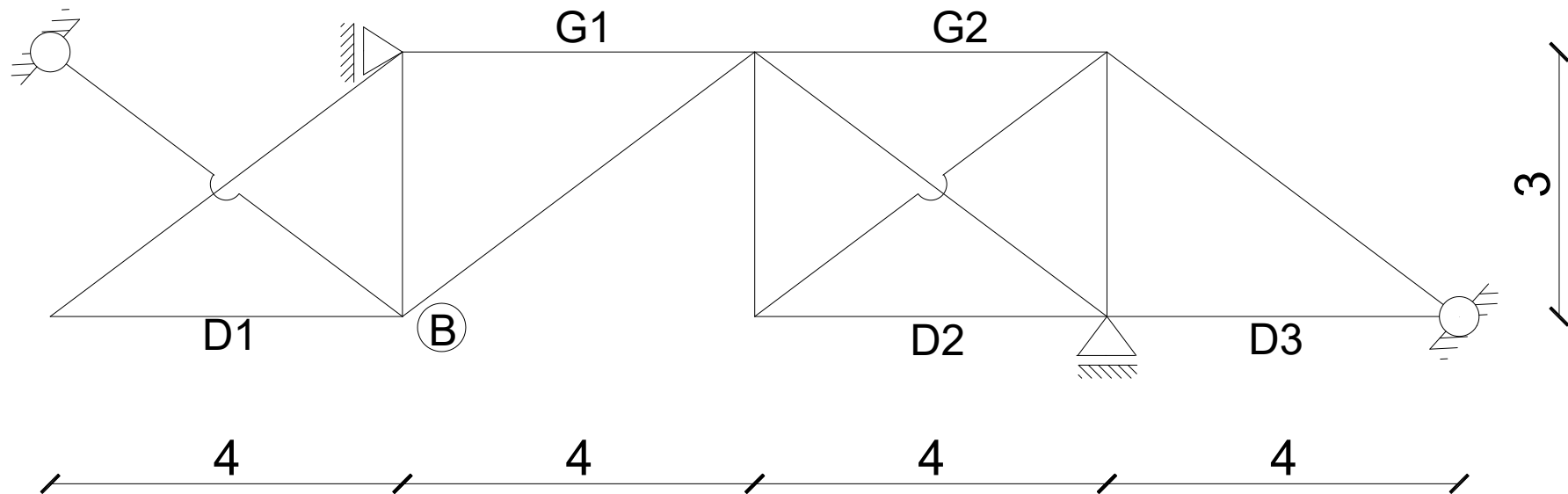


Stopień statycznej niewyznaczalności:

$$n_s = l_r + l_{pr} - 2 \cdot w = 6 + 14 - 2 \cdot 9 = 2$$

dr inż. Hanna Weber

Oznaczenie prętów:

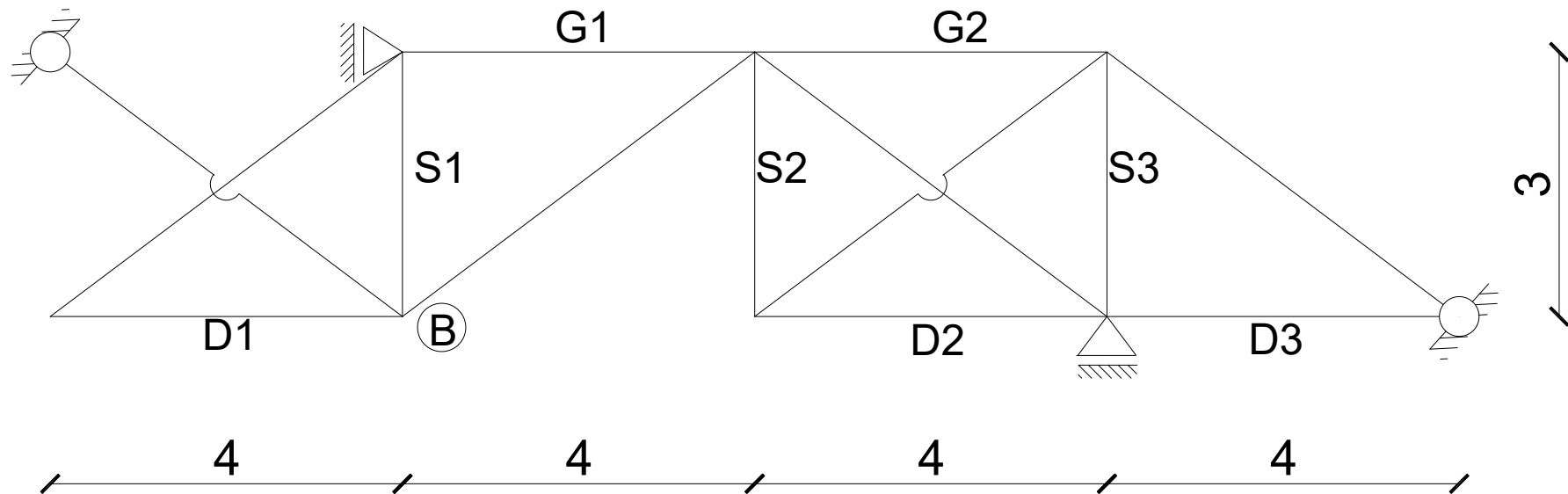


Stopień statycznej niewyznaczalności:

$$n_s = l_r + l_{pr} - 2 \cdot w = 6 + 14 - 2 \cdot 9 = 2$$

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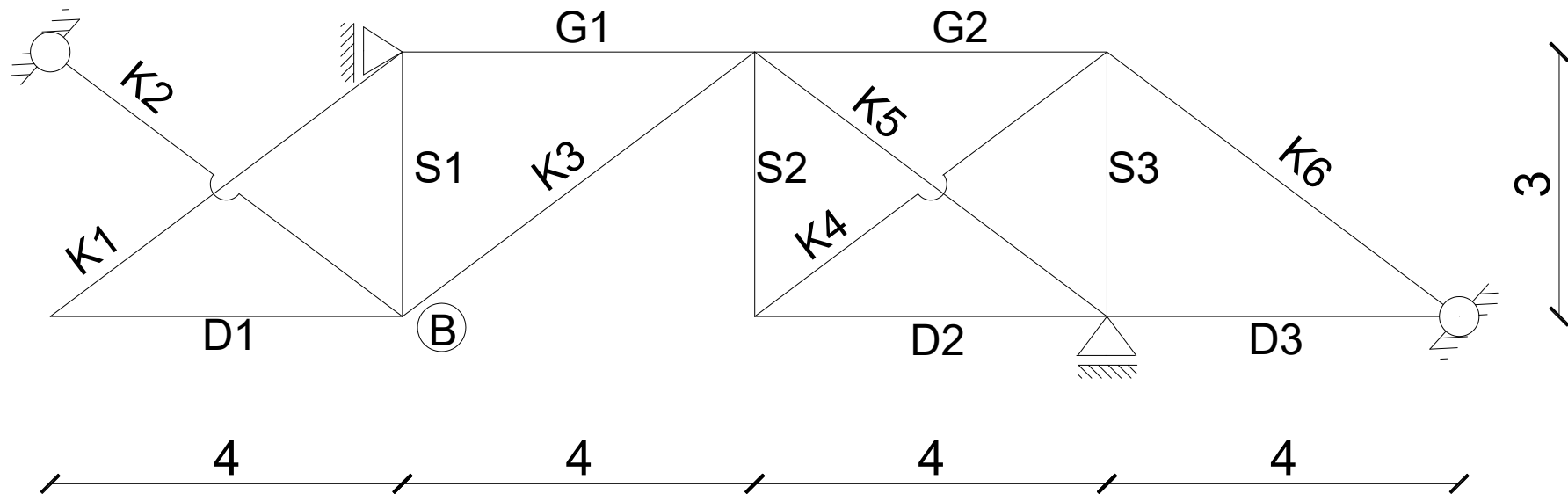
Oznaczenie prętów:



Stopień statycznej niewyznaczalności:

$$n_s = l_r + l_{pr} - 2 \cdot w = 6 + 14 - 2 \cdot 9 = 2$$

Oznaczenie prętów:

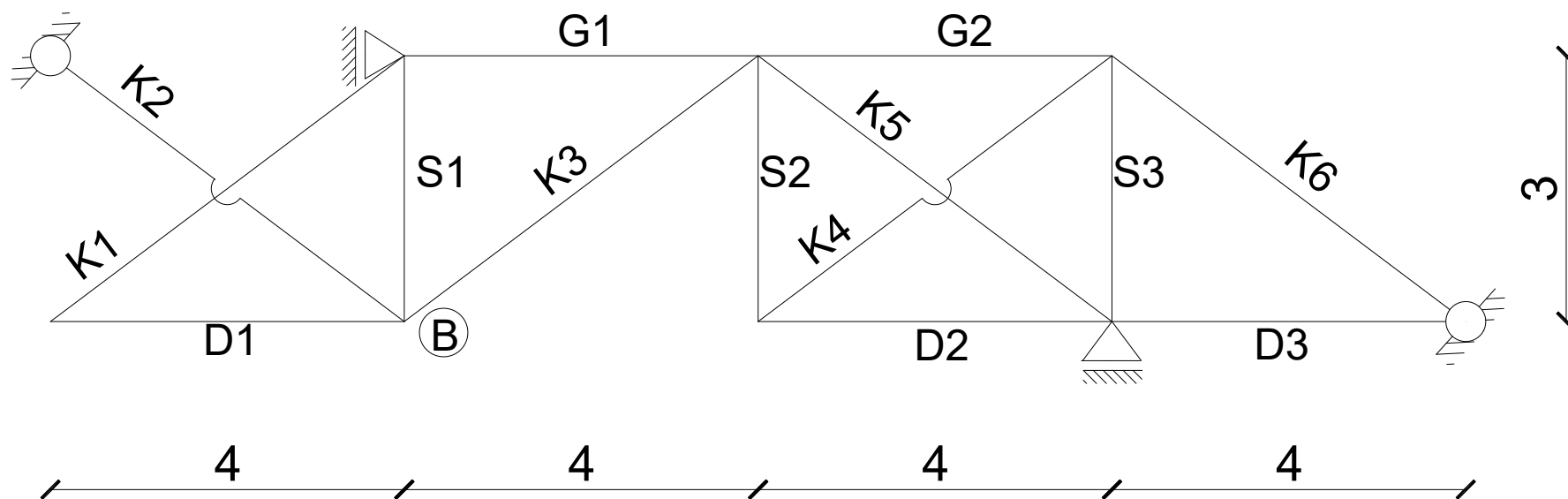


Stopień statycznej niewyznaczalności:

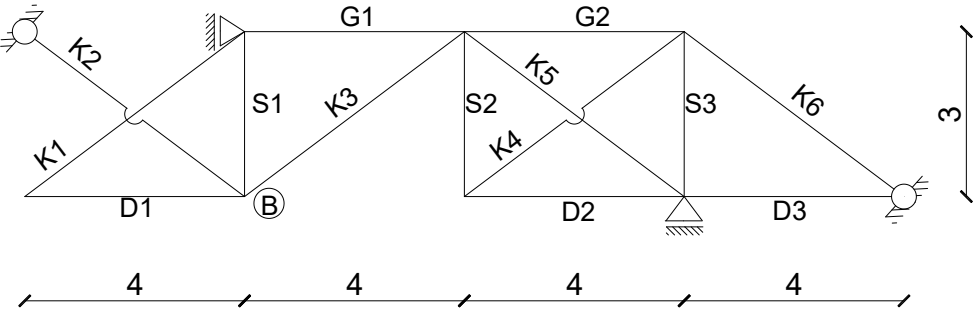
$$n_s = l_r + l_{pr} - 2 \cdot w = 6 + 14 - 2 \cdot 9 = 2$$

dr inż. Hanna Weber

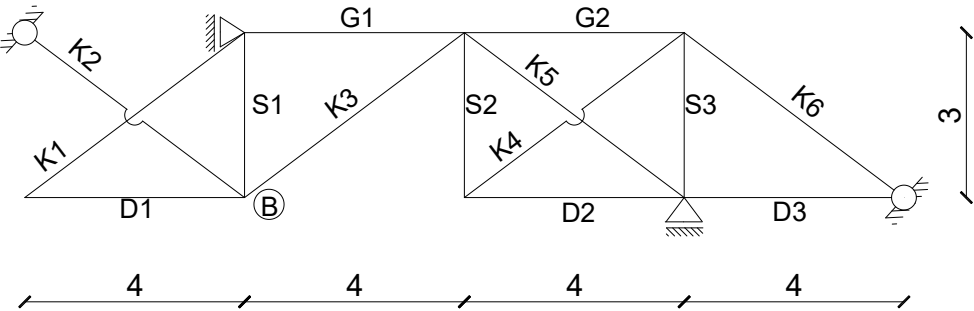
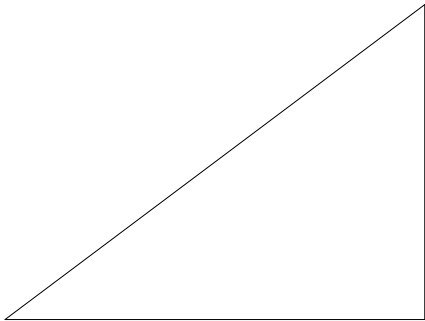
Dobór schematu podstawowego:



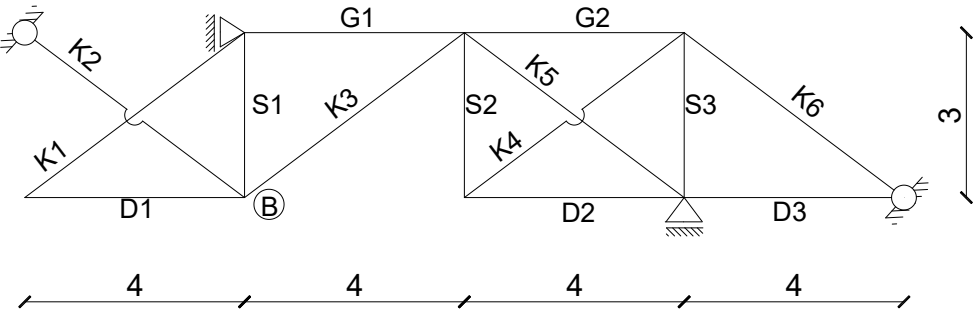
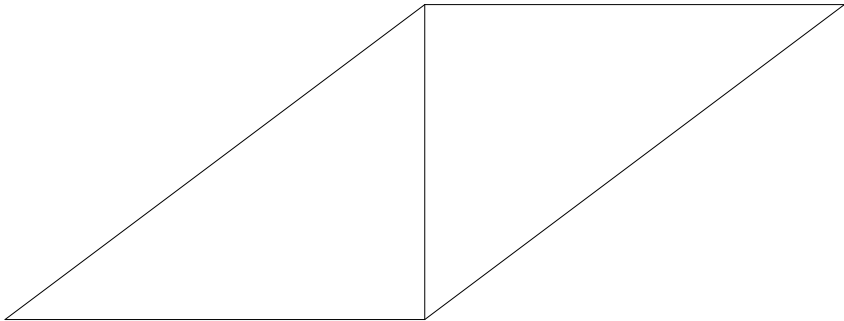
Dobór schematu podstawowego:



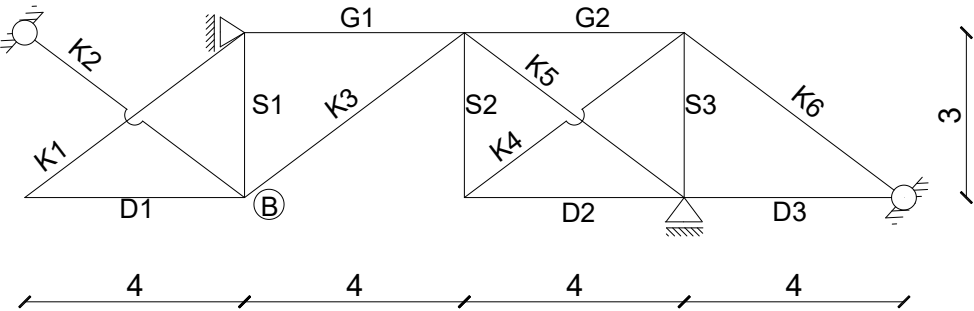
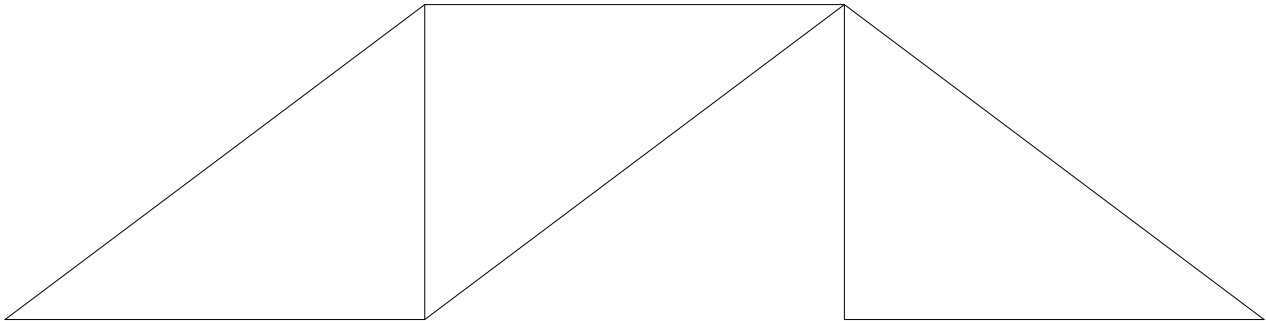
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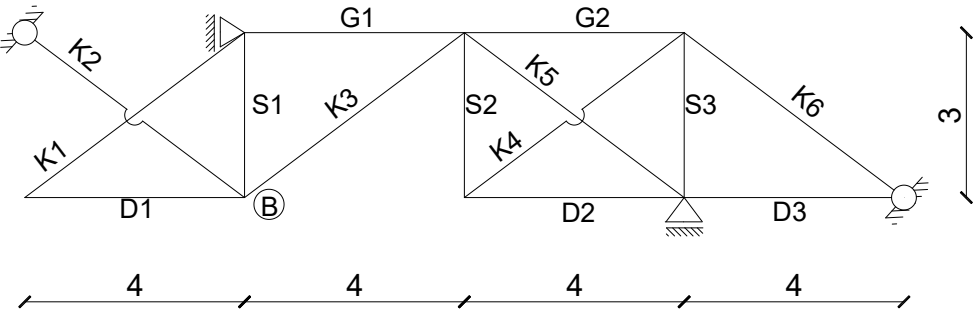
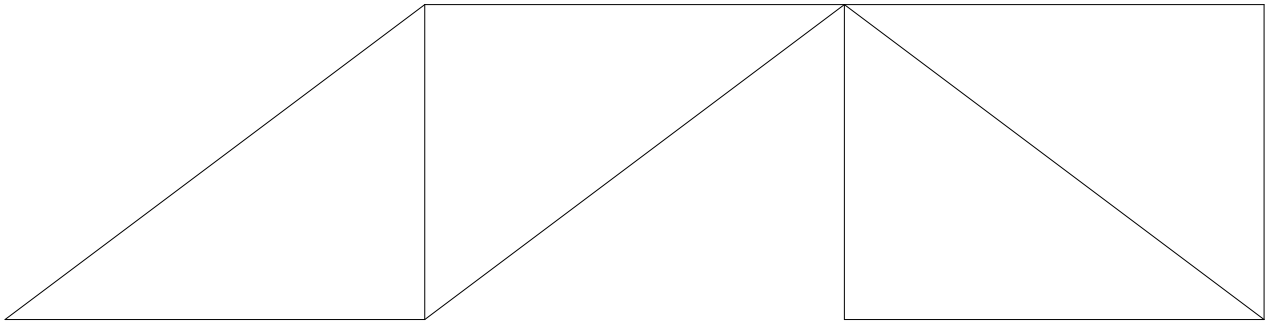
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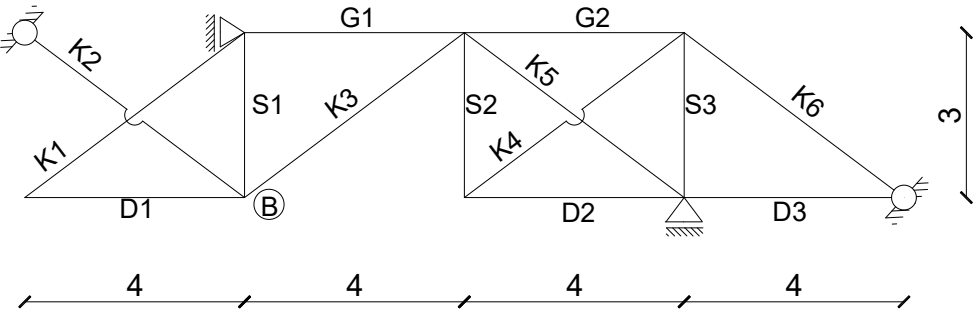
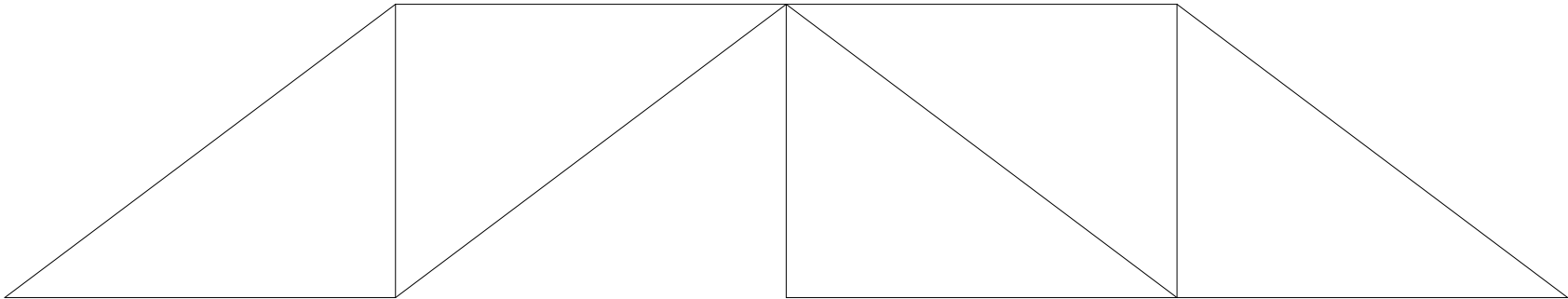
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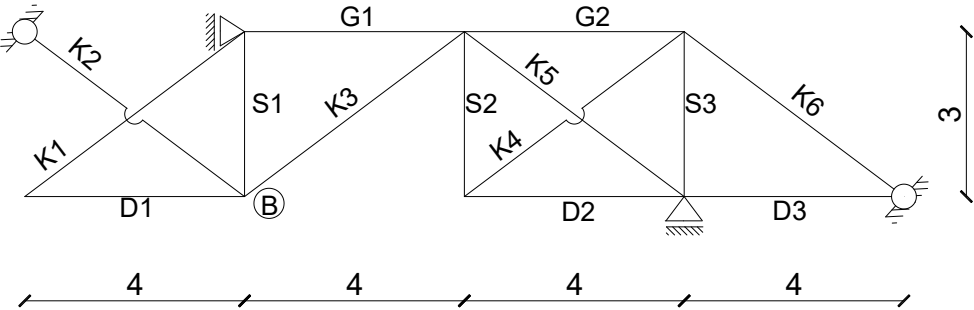
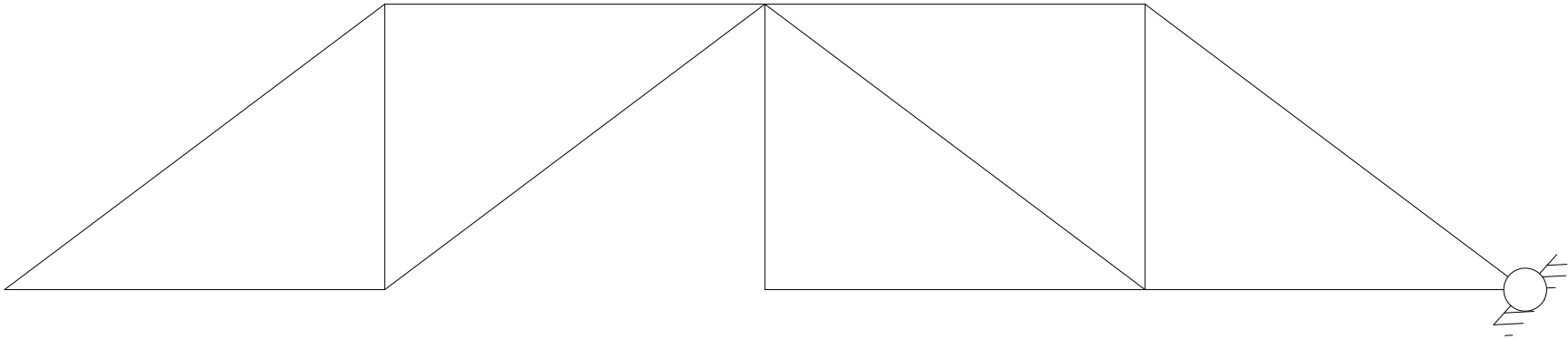
Dobór schematu podstawowego:



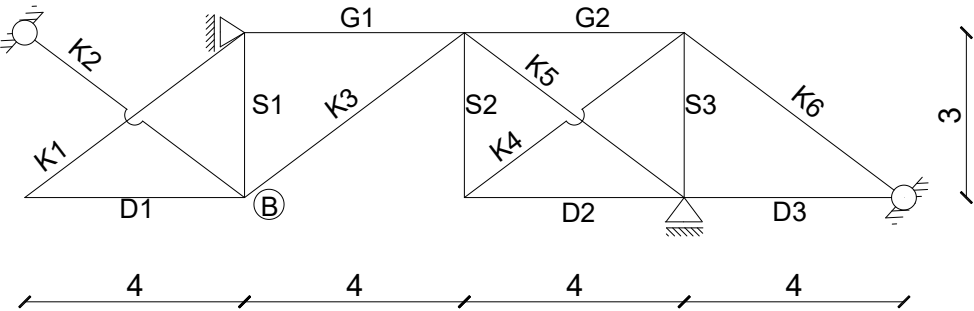
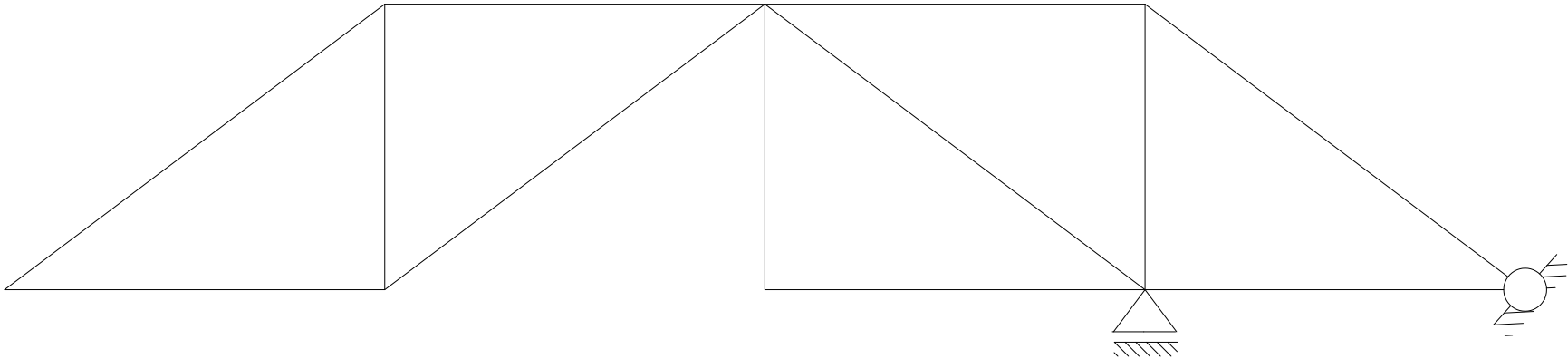
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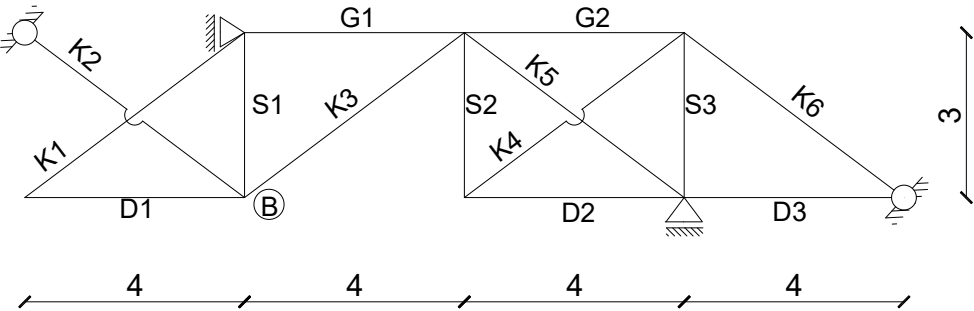
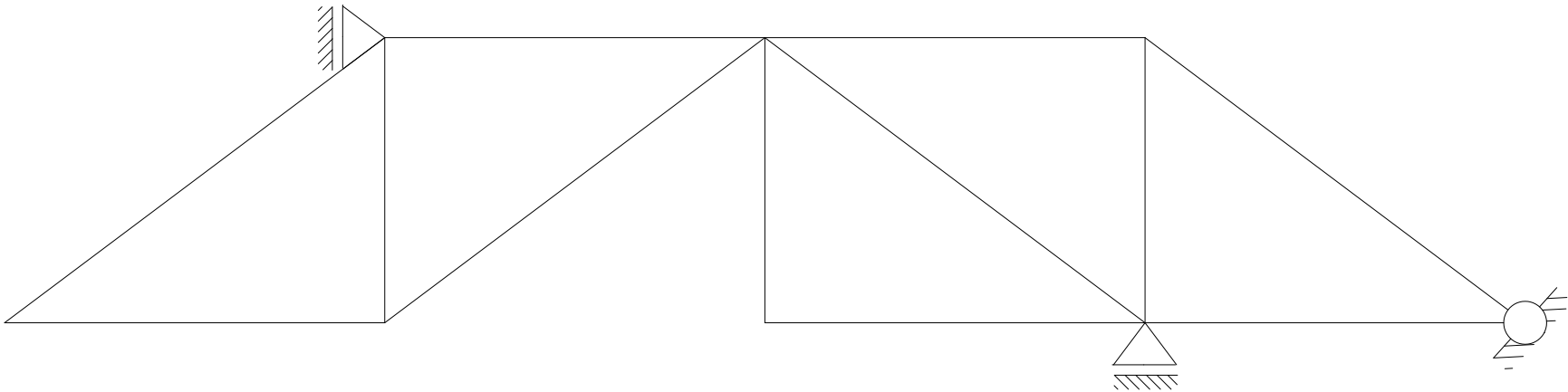
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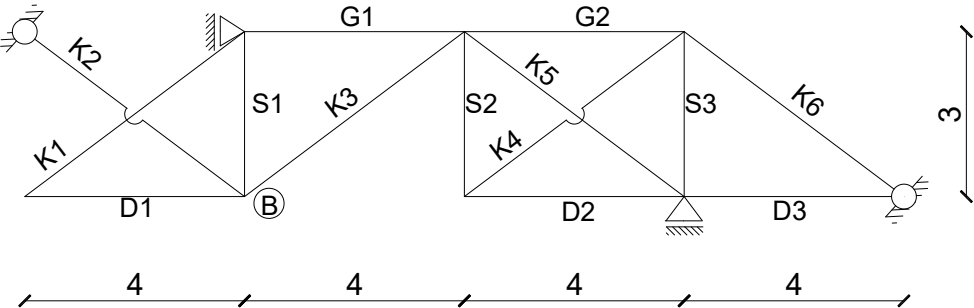
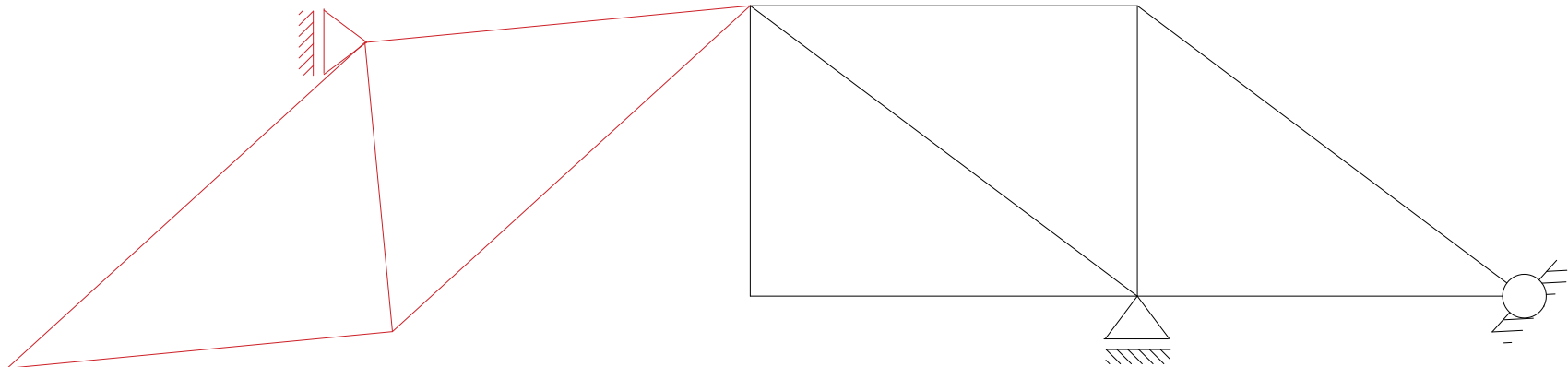
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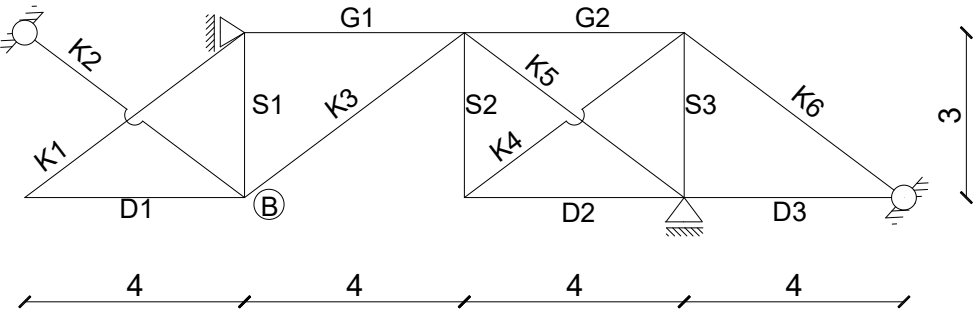
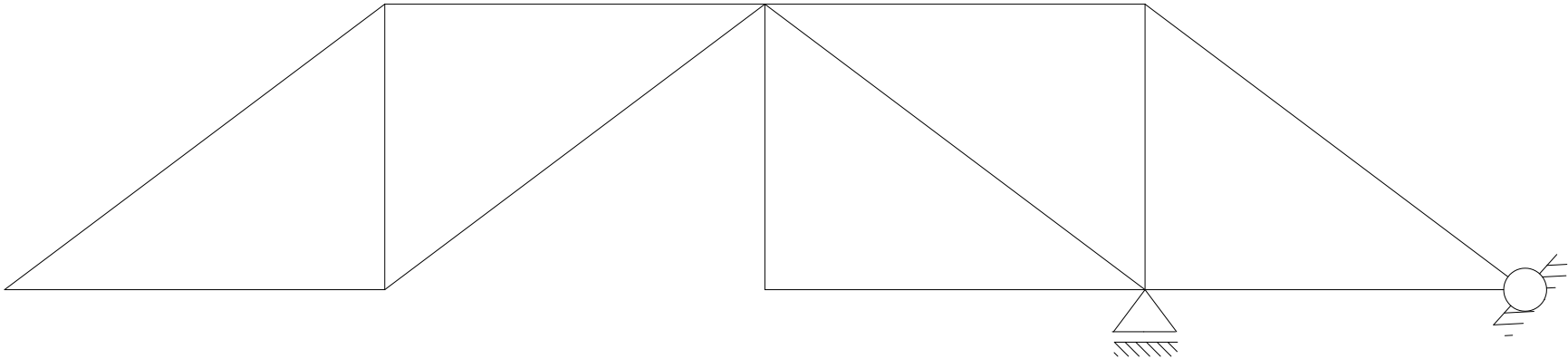
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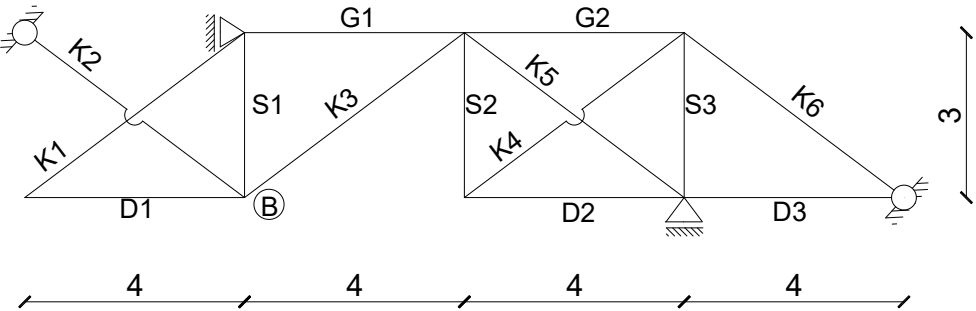
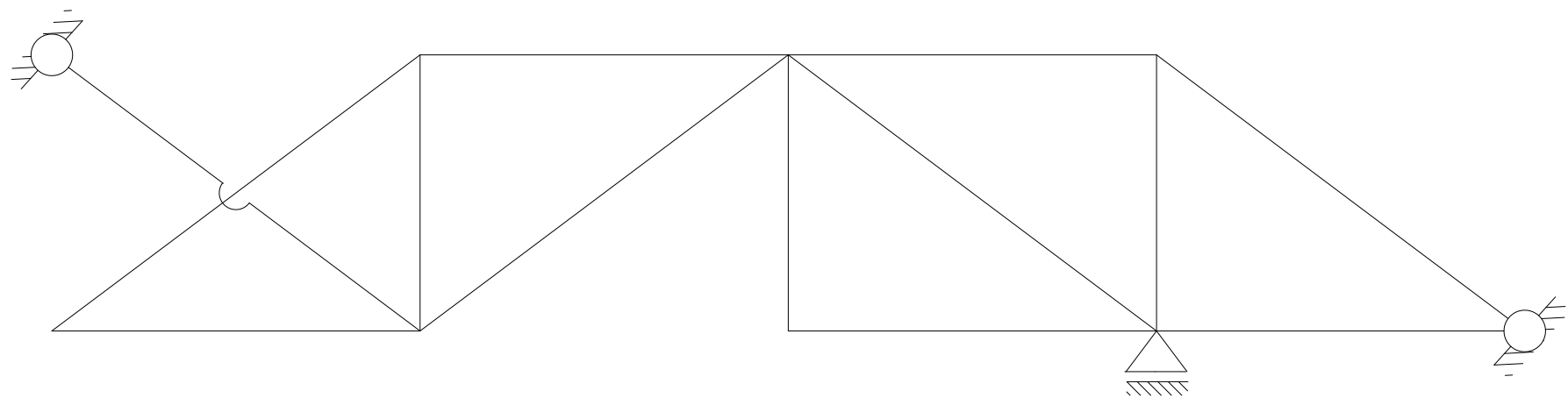
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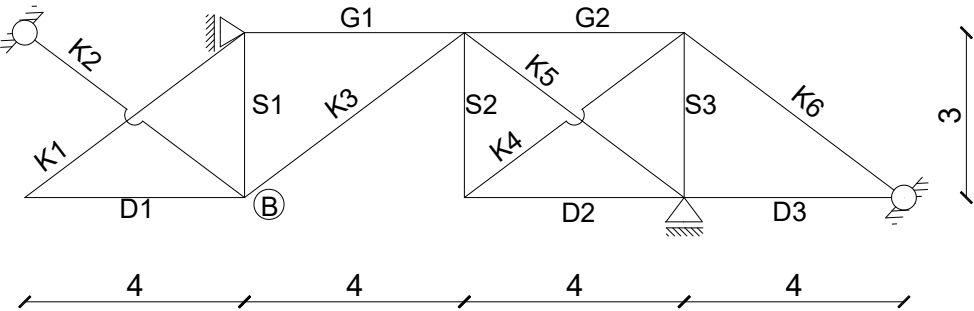
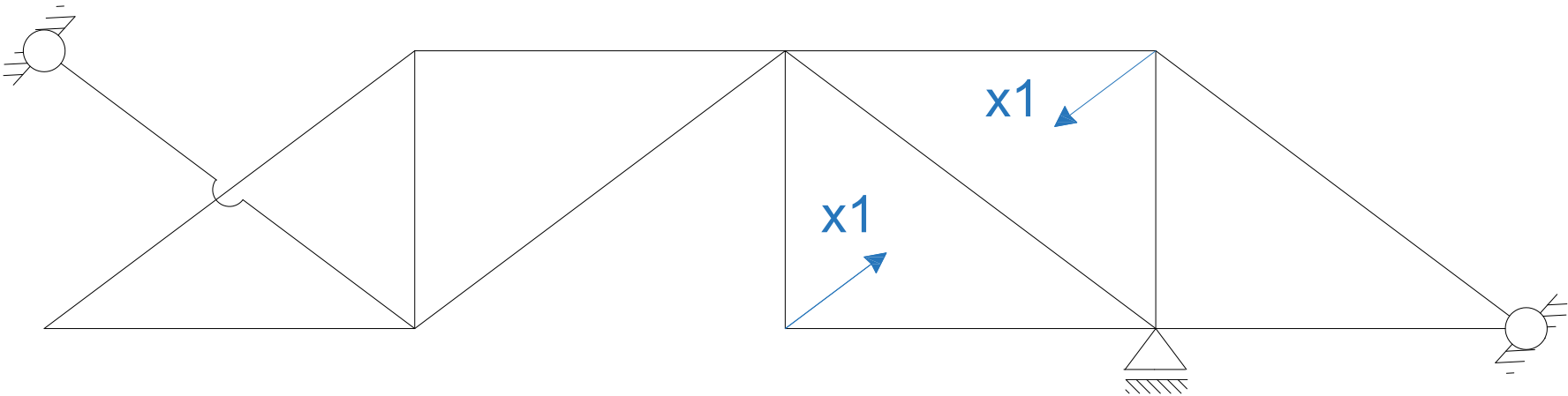
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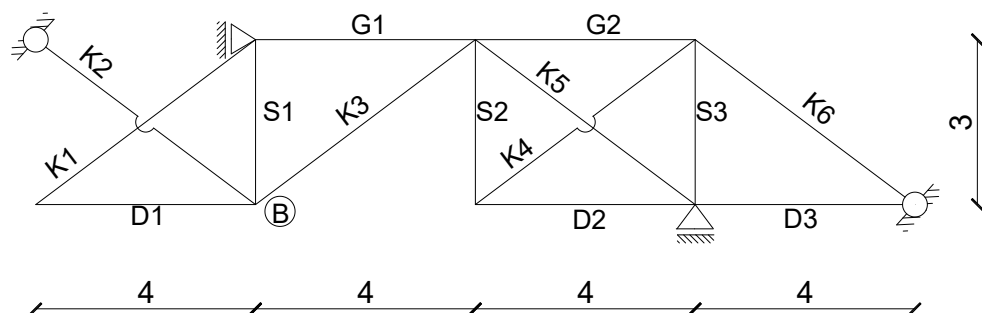
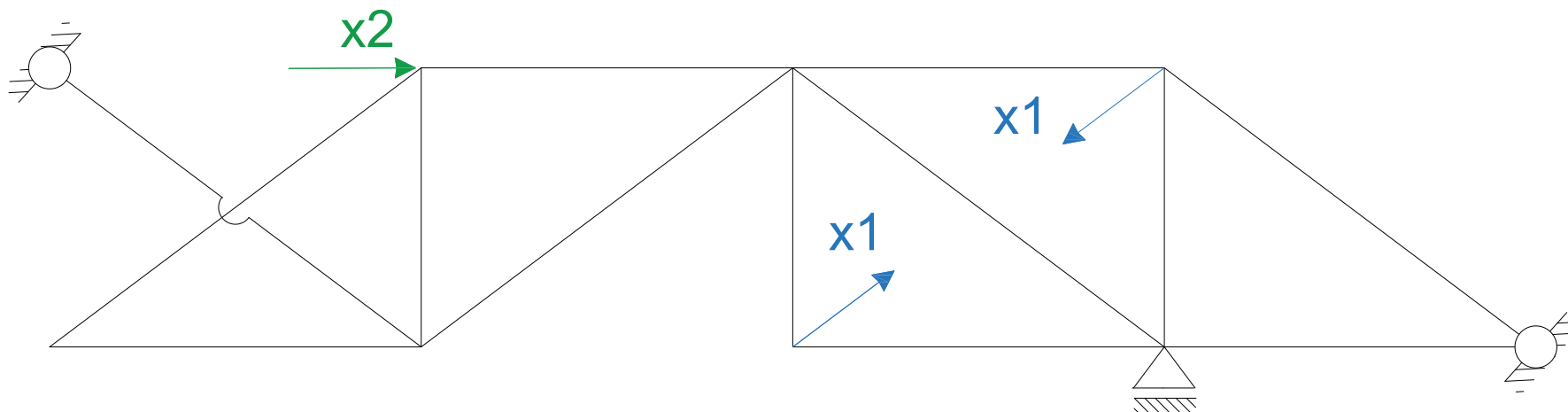
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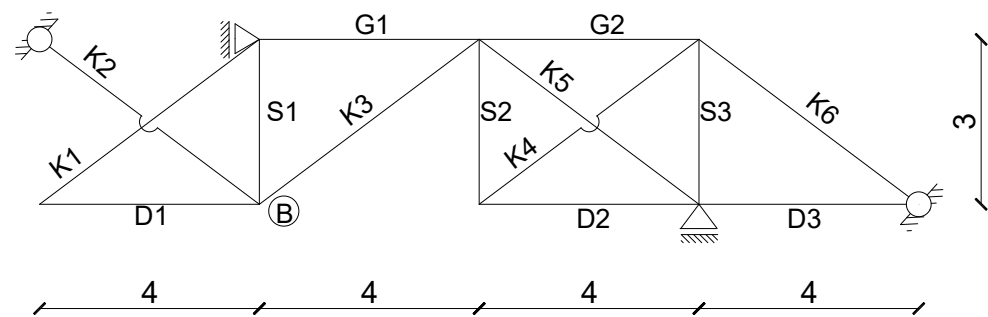
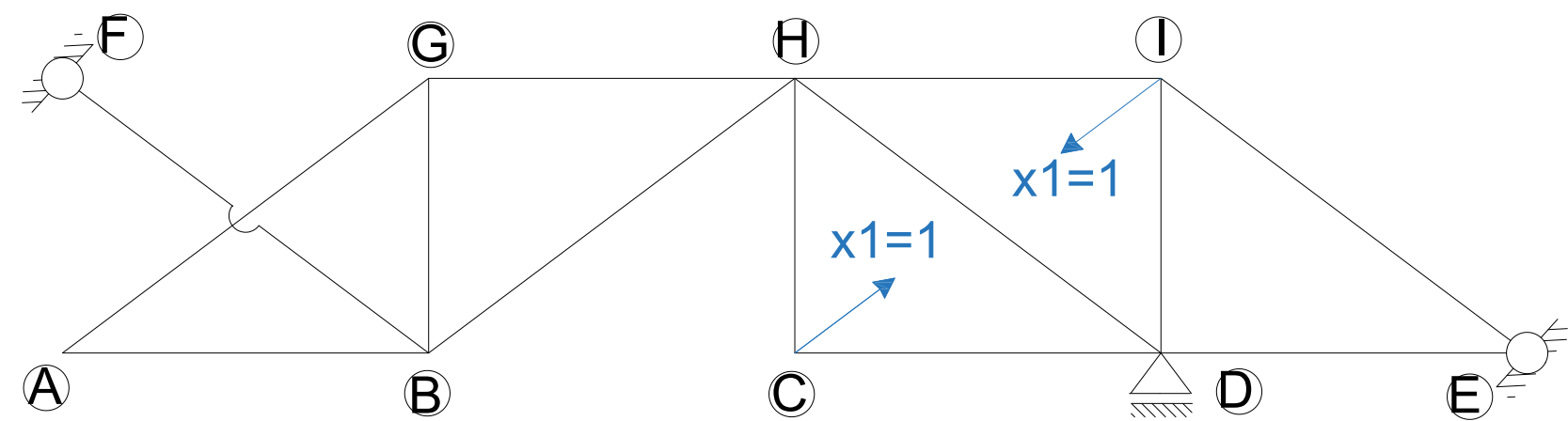
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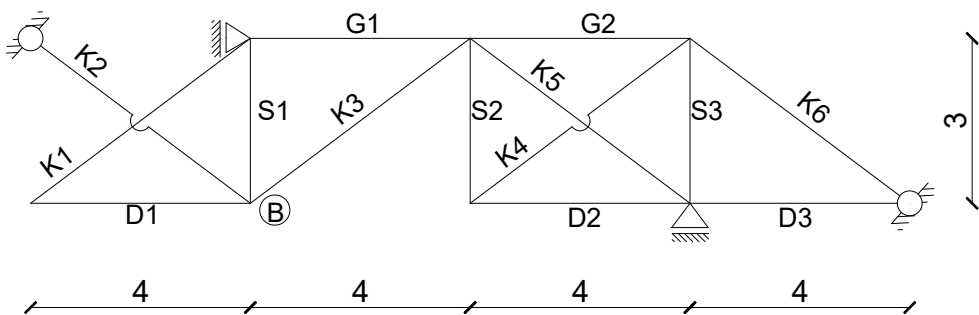
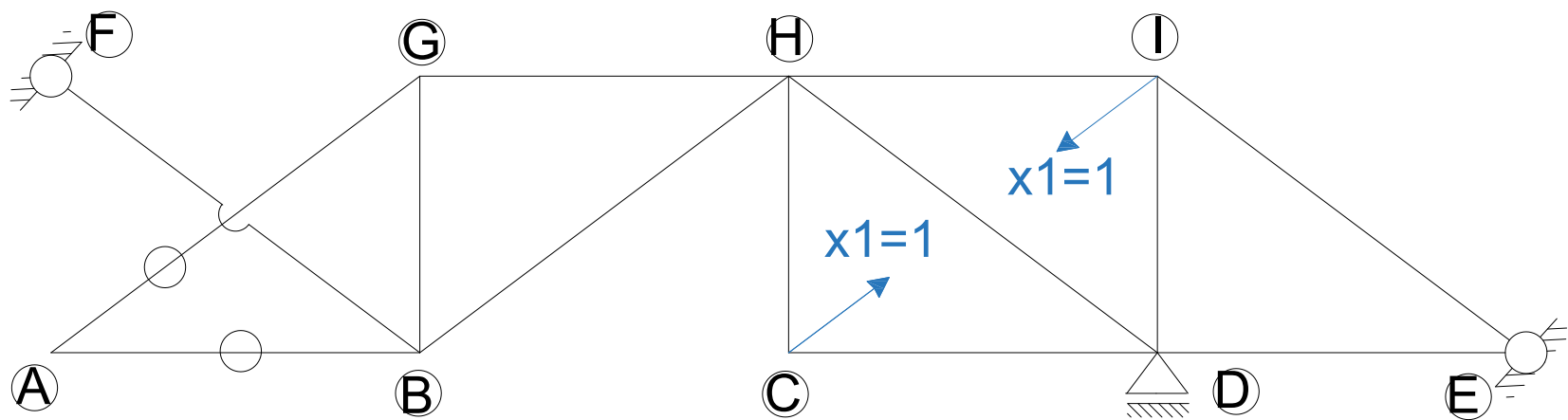
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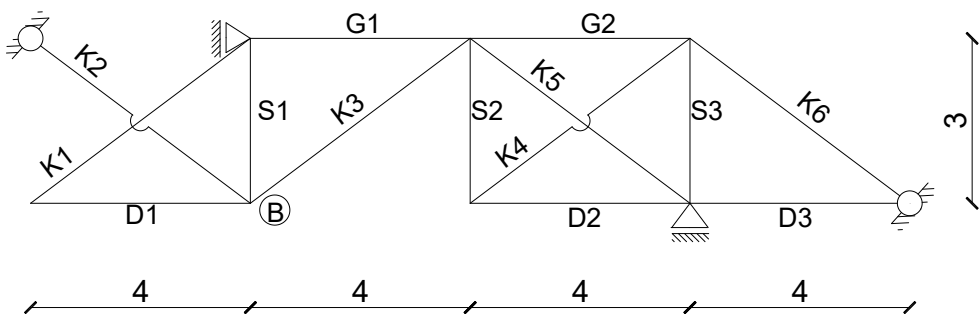
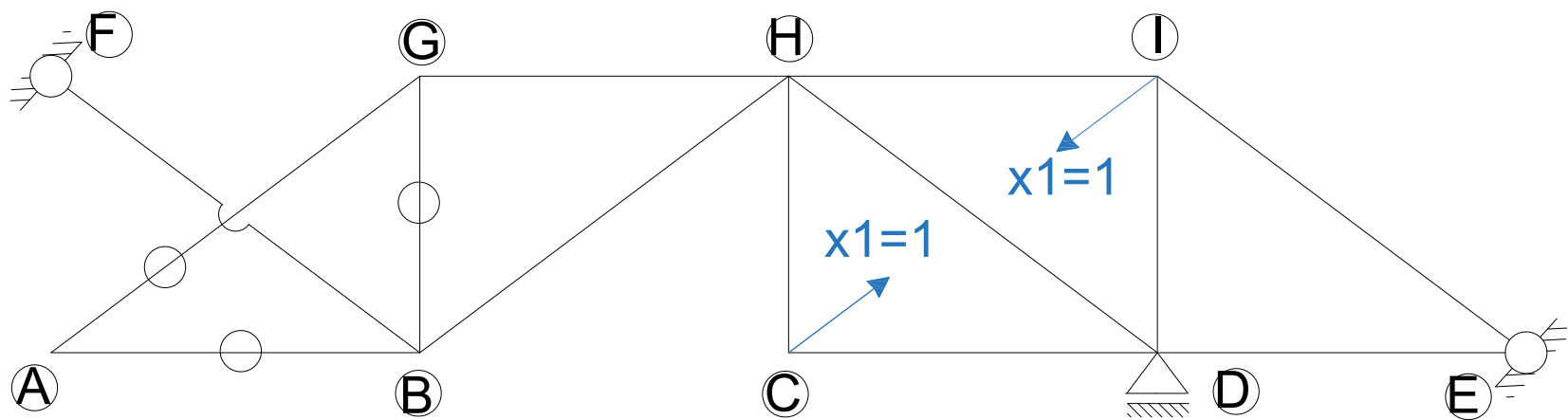
Wykresy: stan $x_1=1$, siły N1



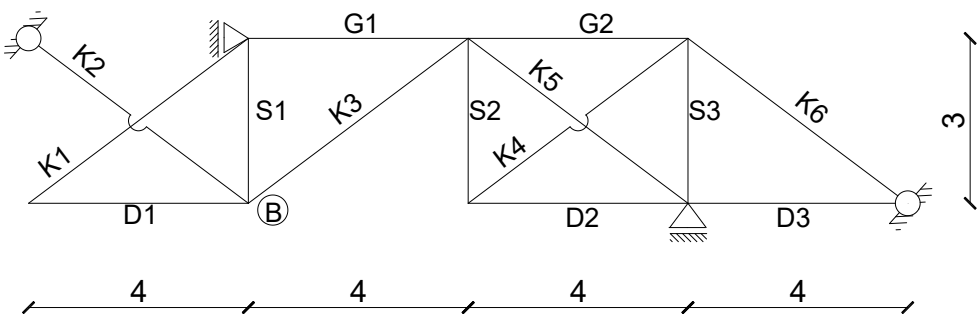
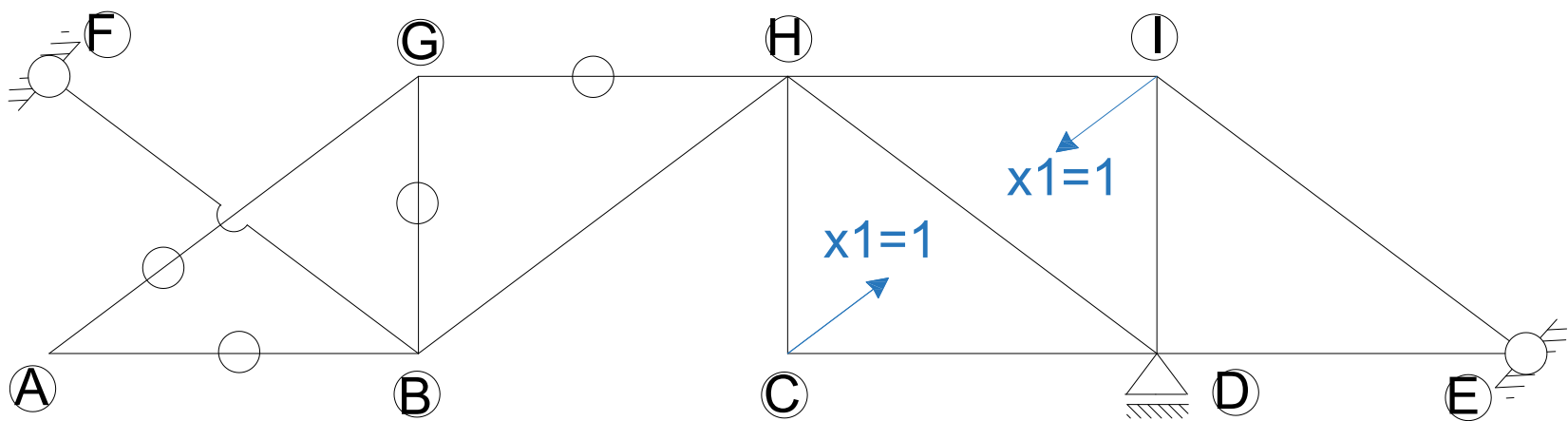
Wykresy: stan $x_1=1$, siły N1



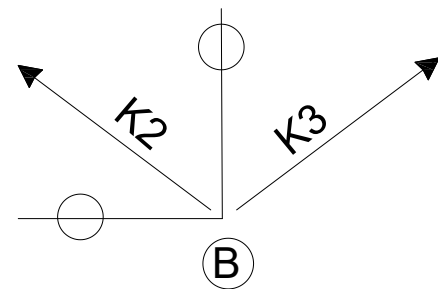
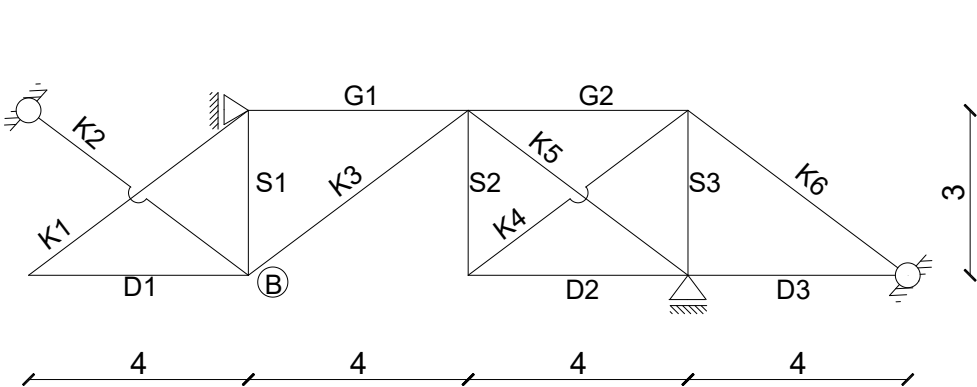
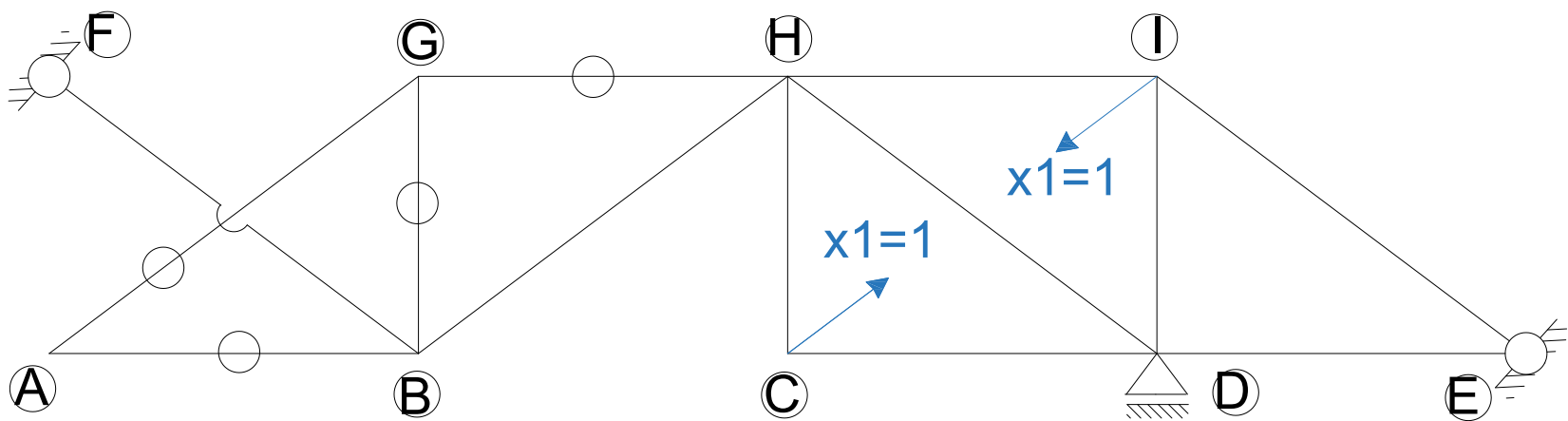
Wykresy: stan $x_1=1$, siły N1



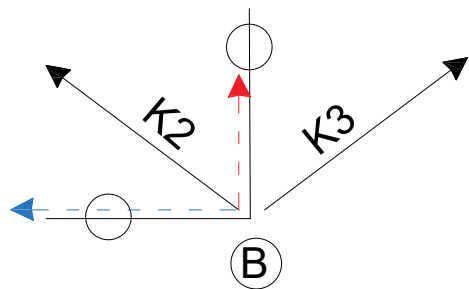
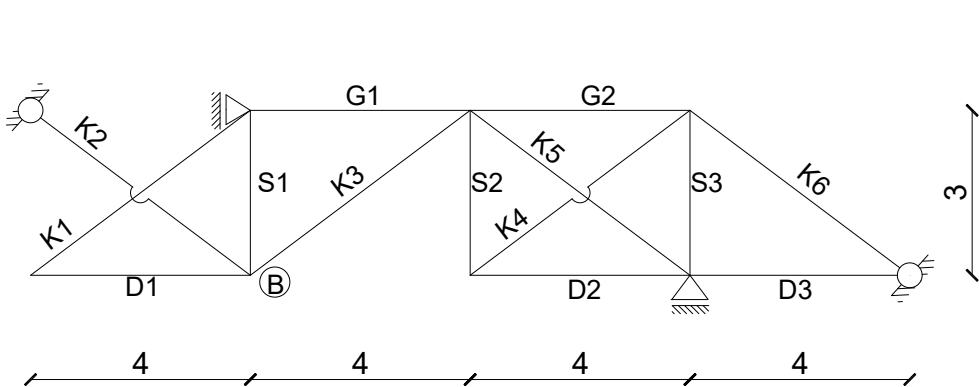
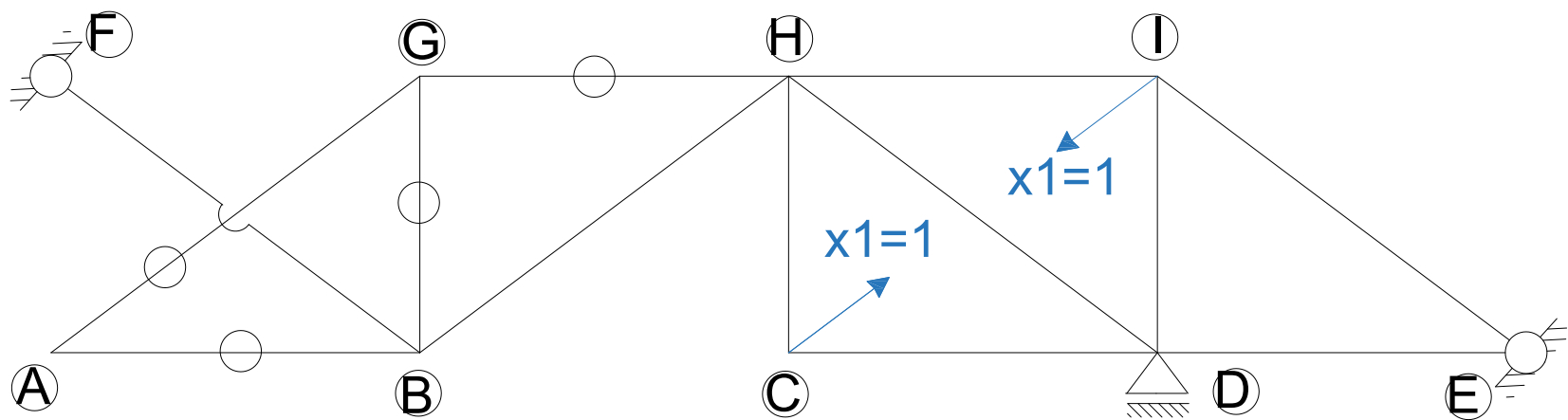
Wykresy: stan $x_1=1$, siły N1



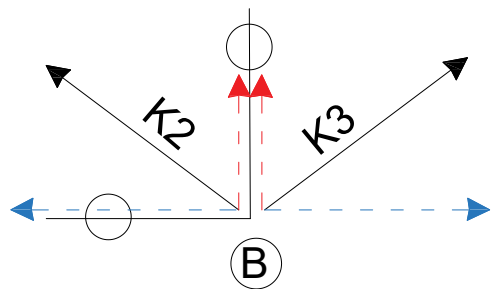
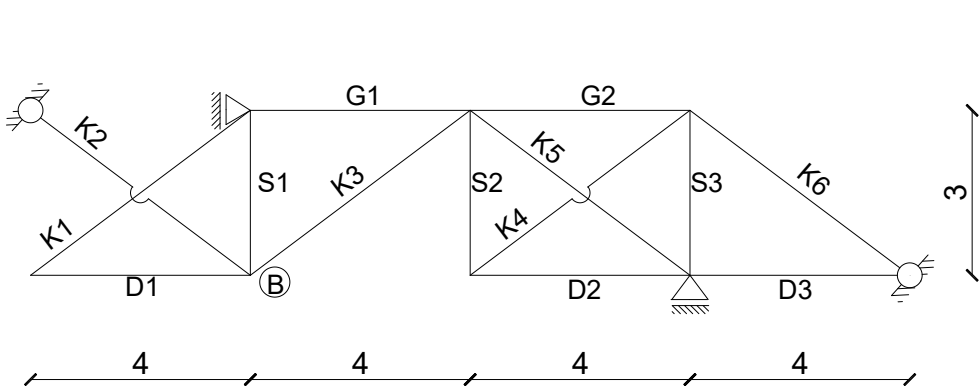
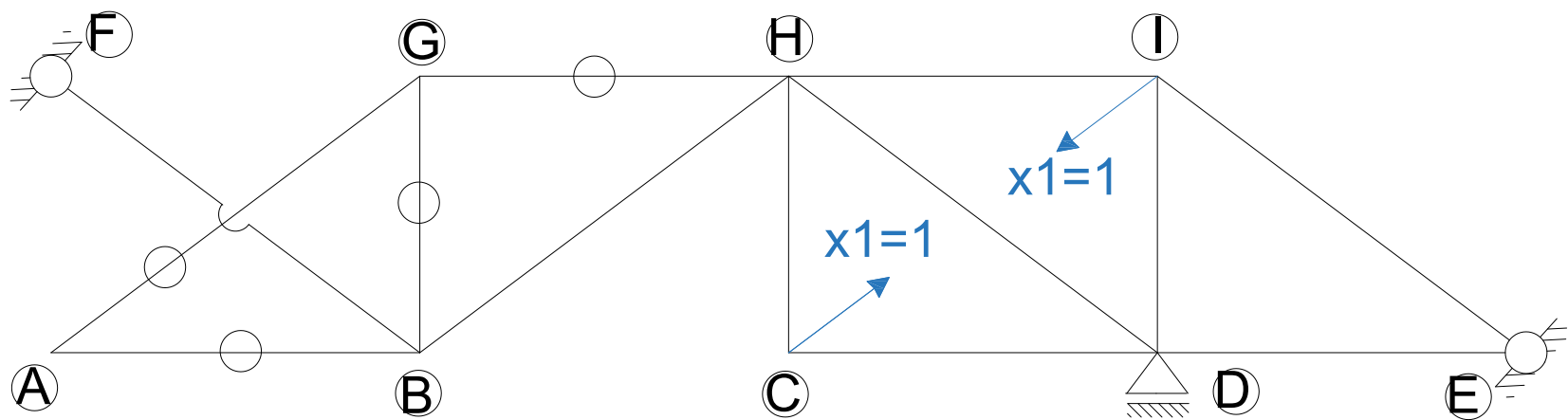
Wykresy: stan $x_1=1$, siły N1



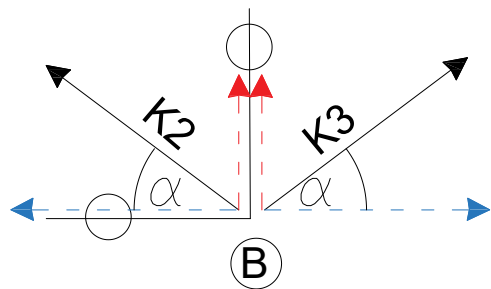
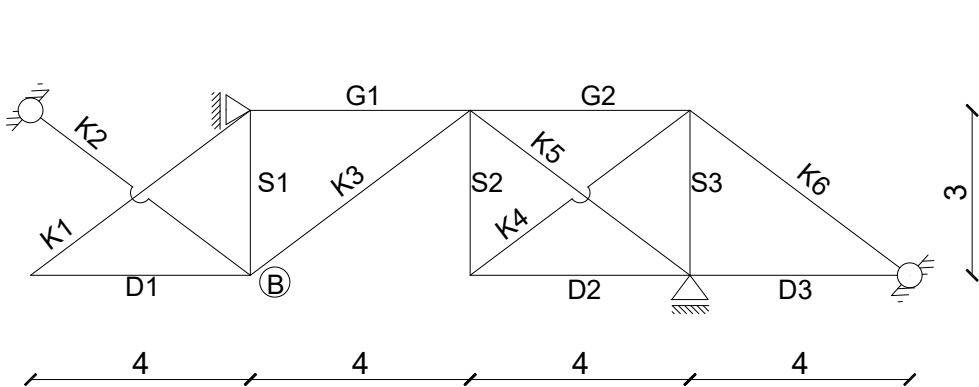
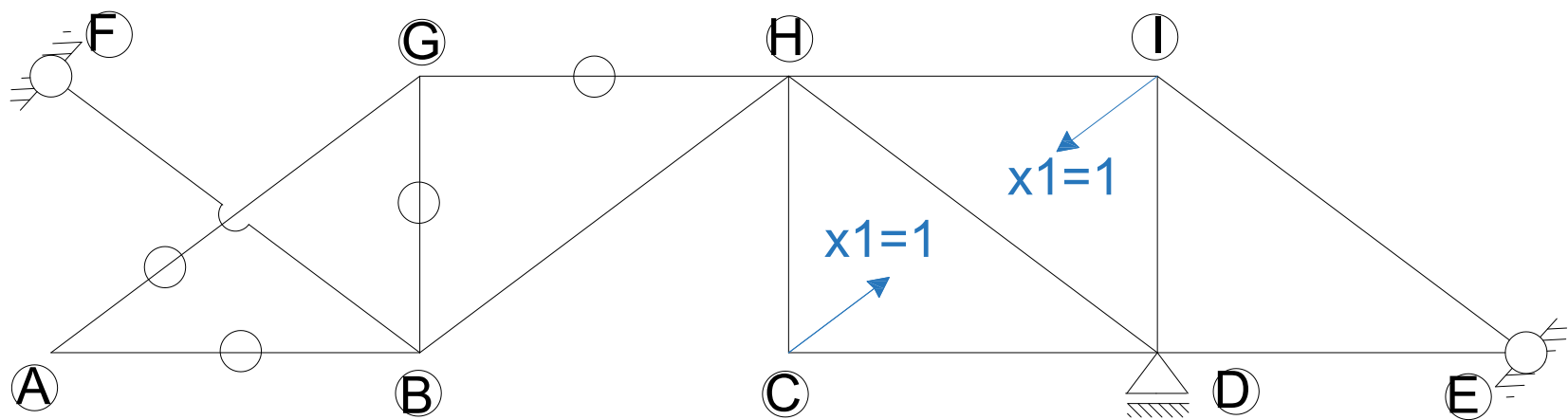
Wykresy: stan $x_1=1$, siły N1



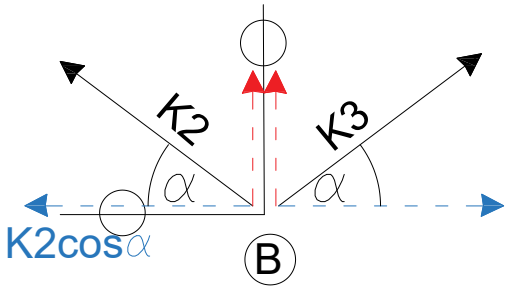
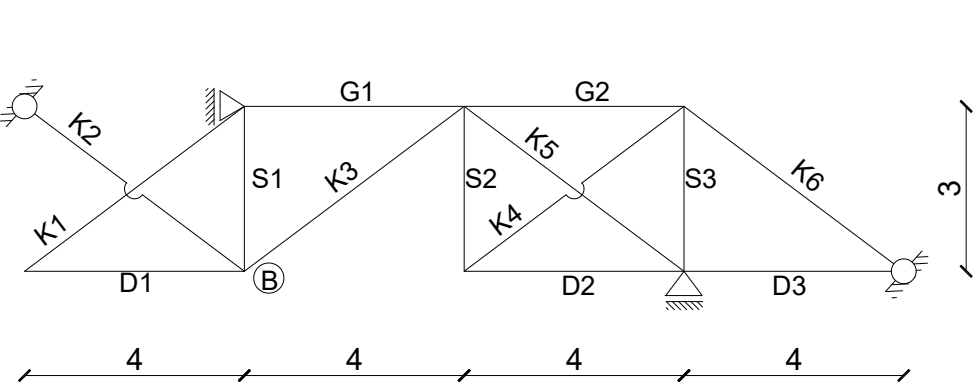
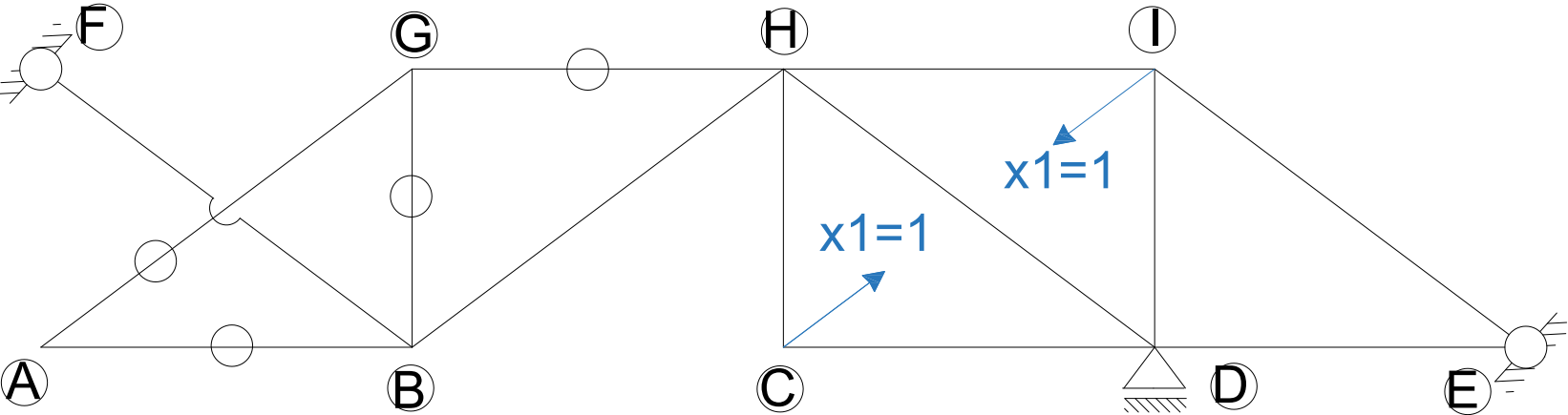
Wykresy: stan $x_1=1$, siły N1



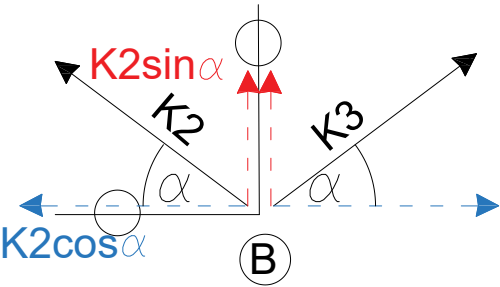
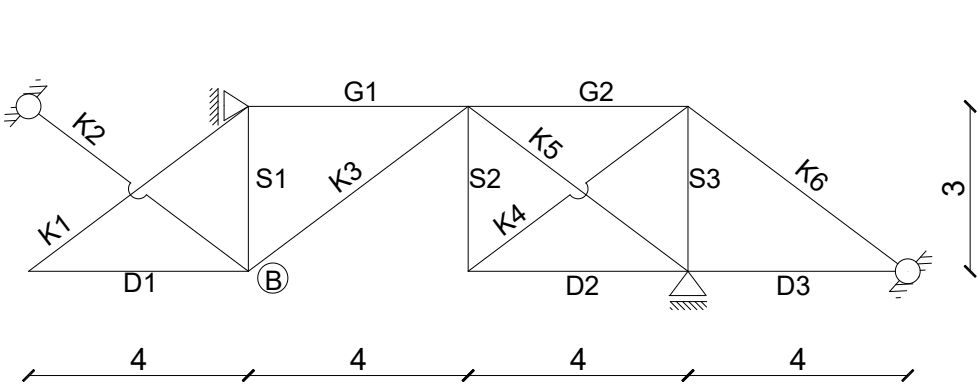
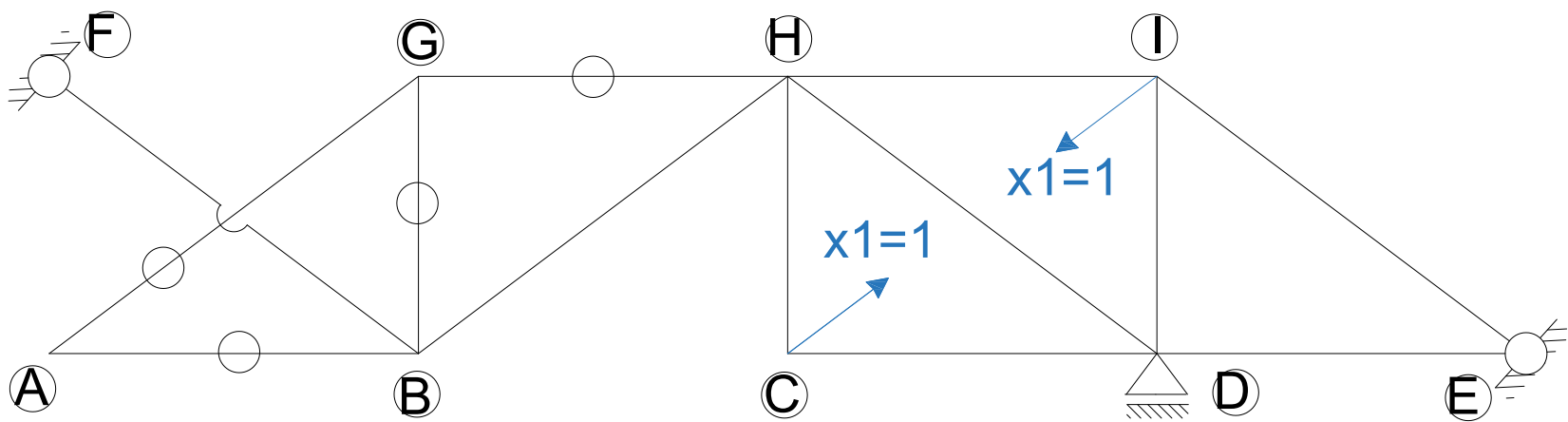
Wykresy: stan $x_1=1$, siły N1



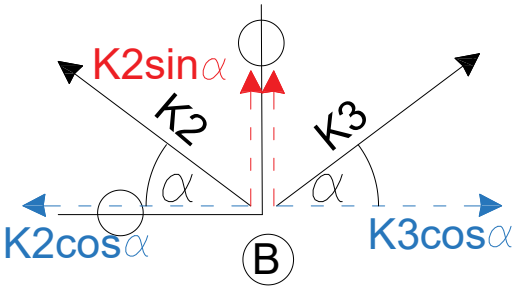
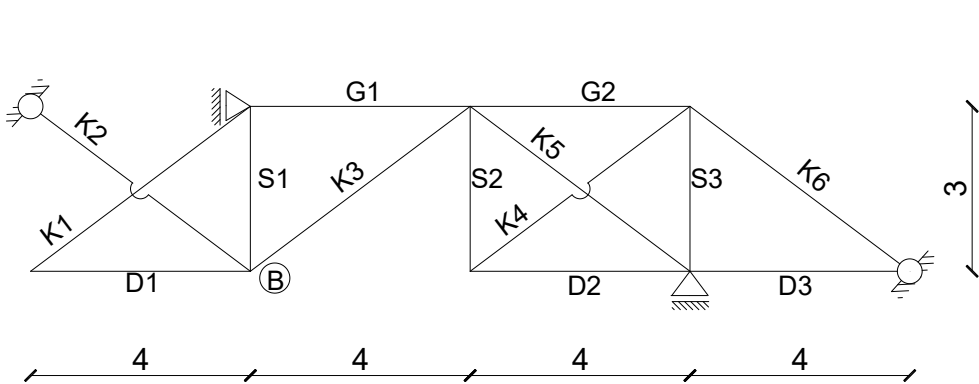
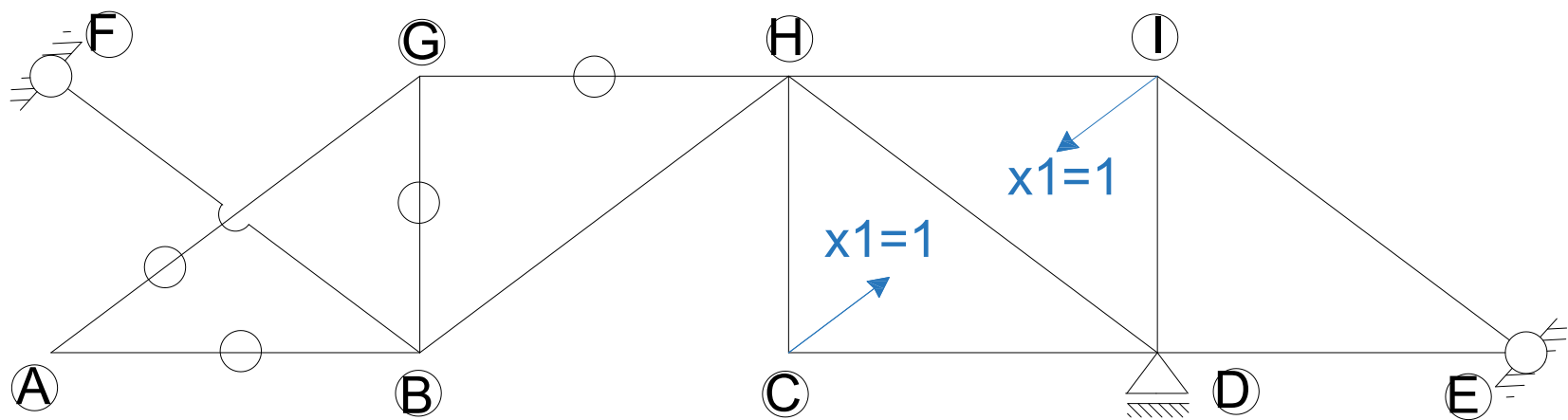
Wykresy: stan $x_1=1$, siły N1



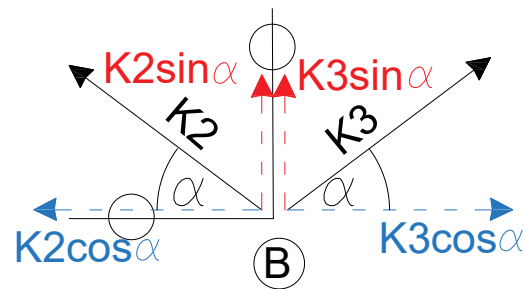
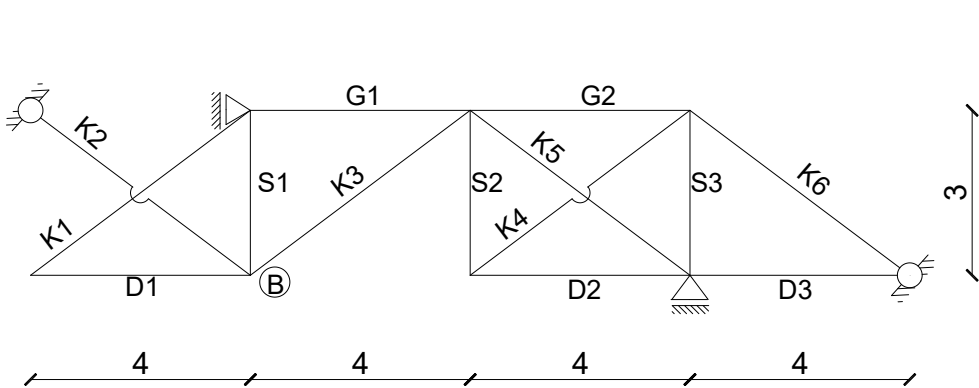
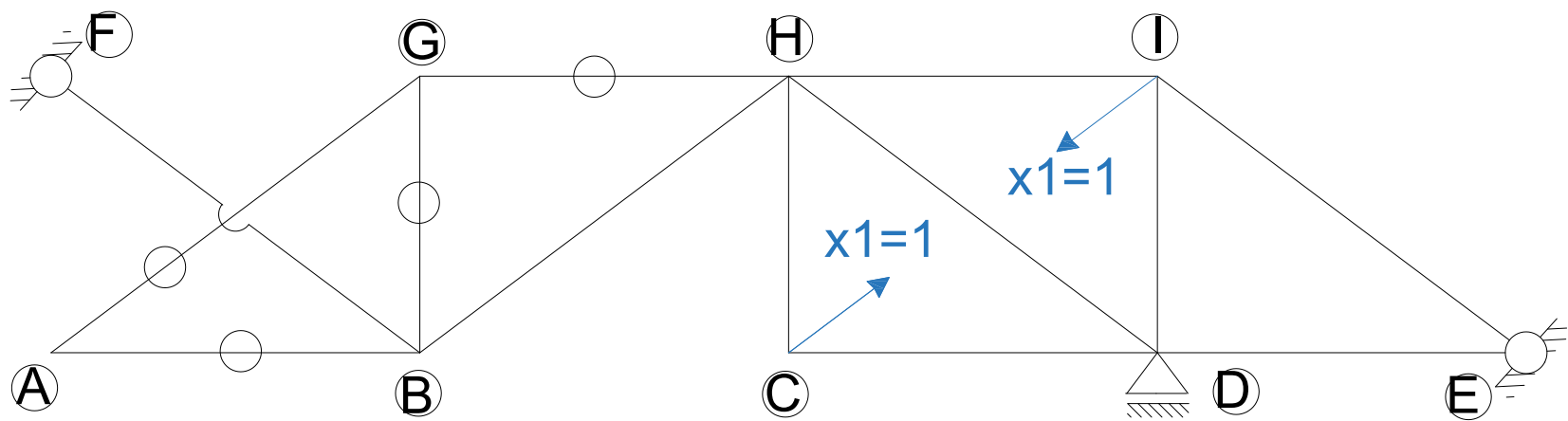
Wykresy: stan $x_1=1$, siły N1



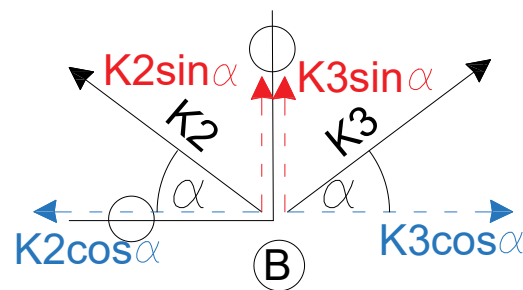
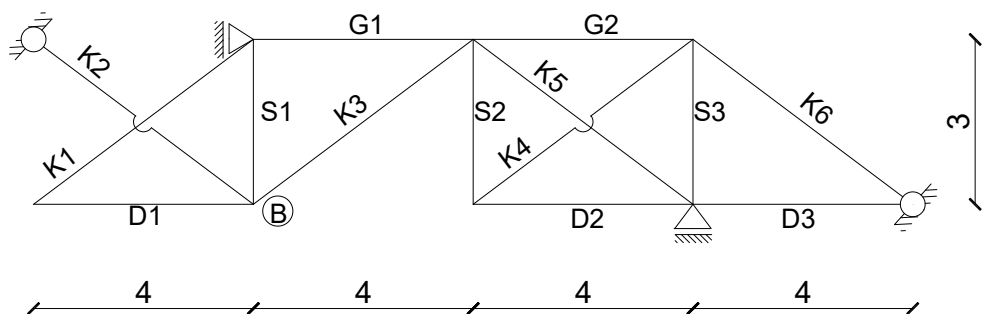
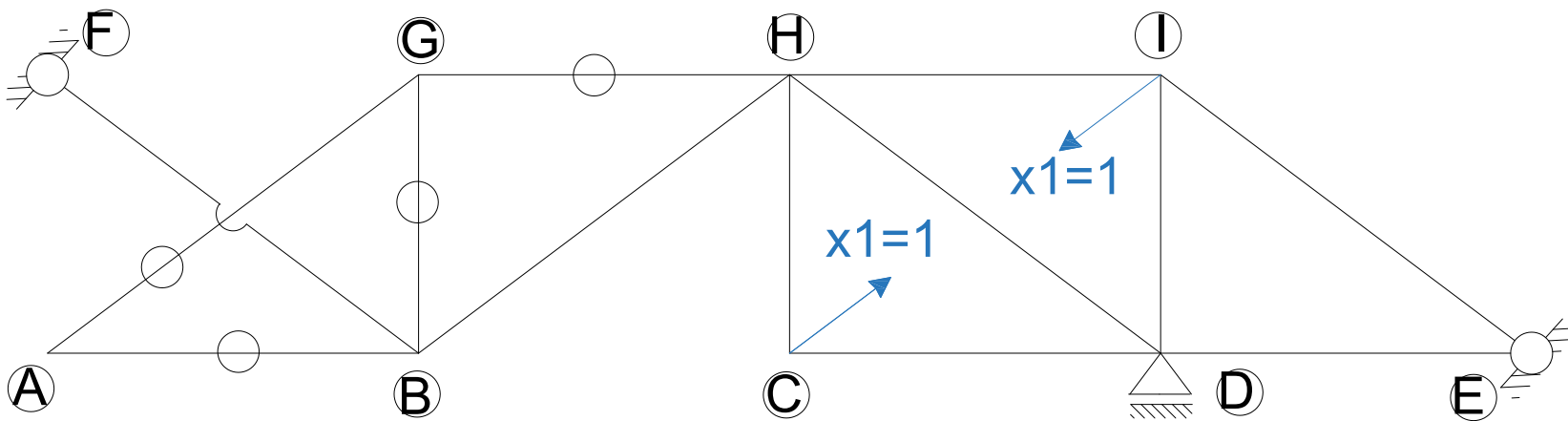
Wykresy: stan $x_1=1$, siły N1



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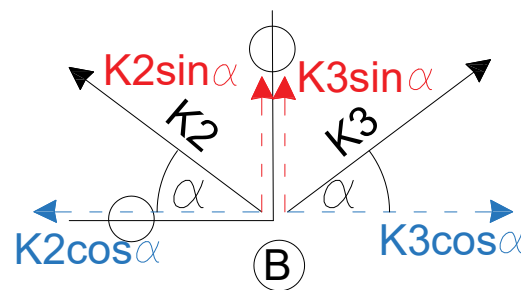
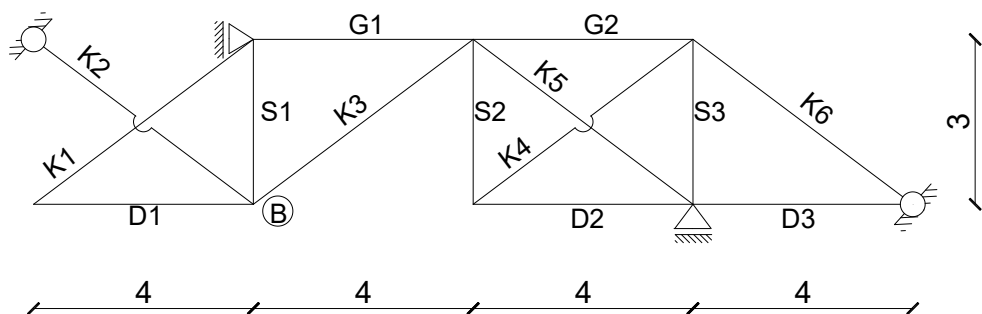
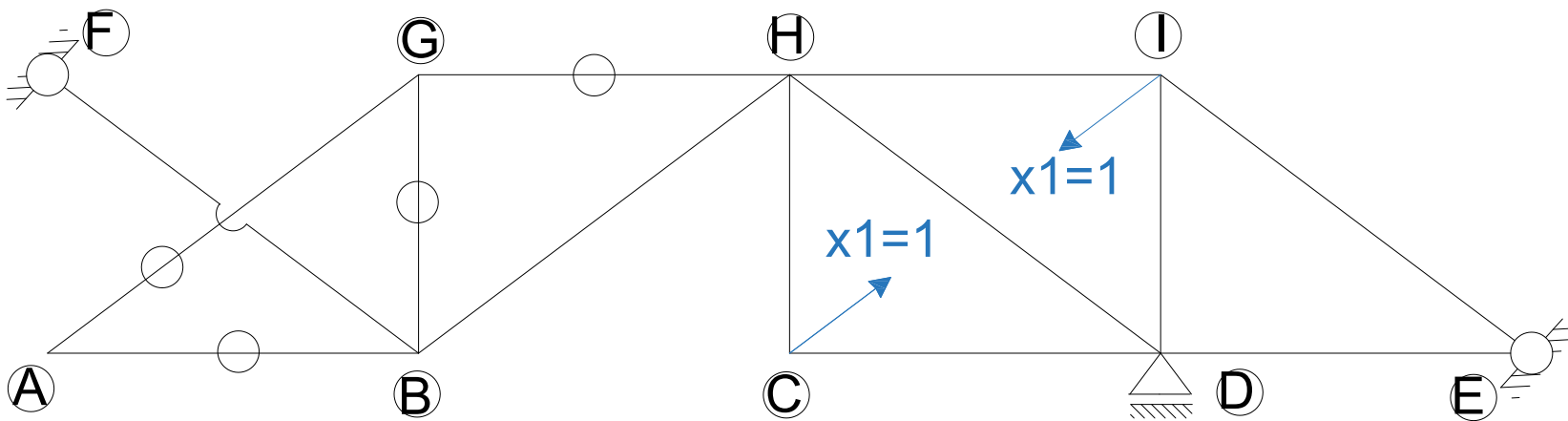


Wykresy: stan $x_1=1$, siły N1



$$\sum R_y = K_2 \sin \alpha + K_3 \sin \alpha = 0$$

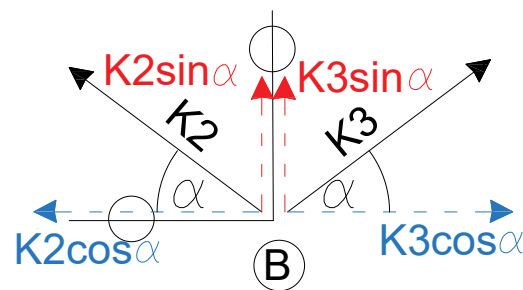
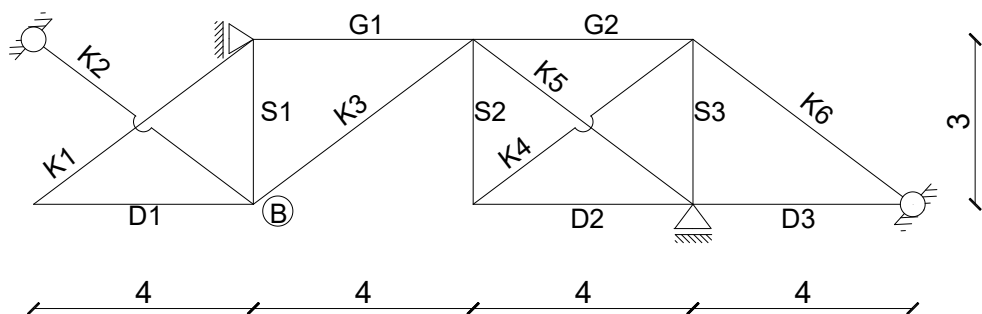
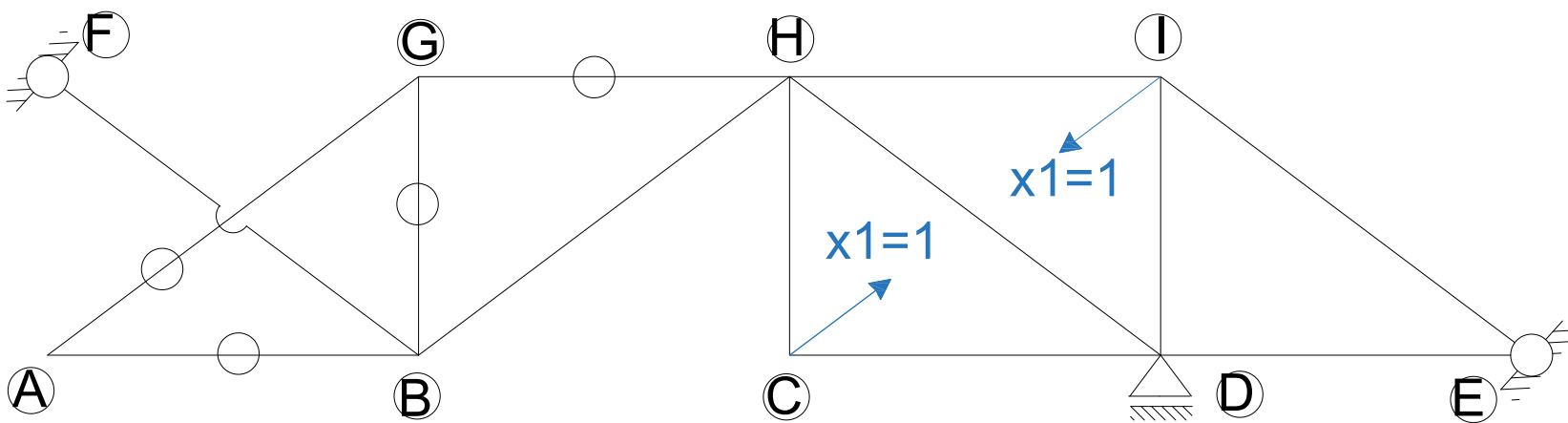
Wykresy: stan $x_1=1$, siły N1



$$\sum R_y = K_2 \sin \alpha + K_3 \sin \alpha = 0$$



Wykresy: stan $x_1=1$, siły N1



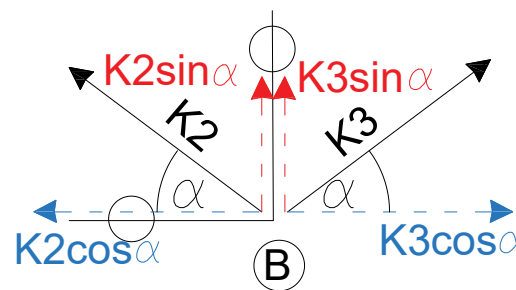
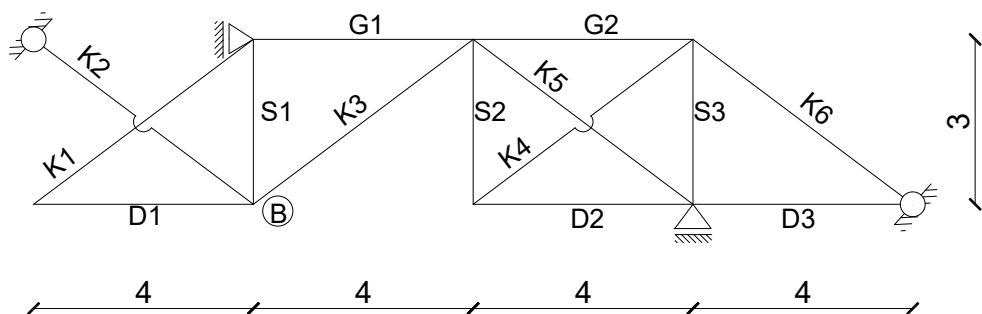
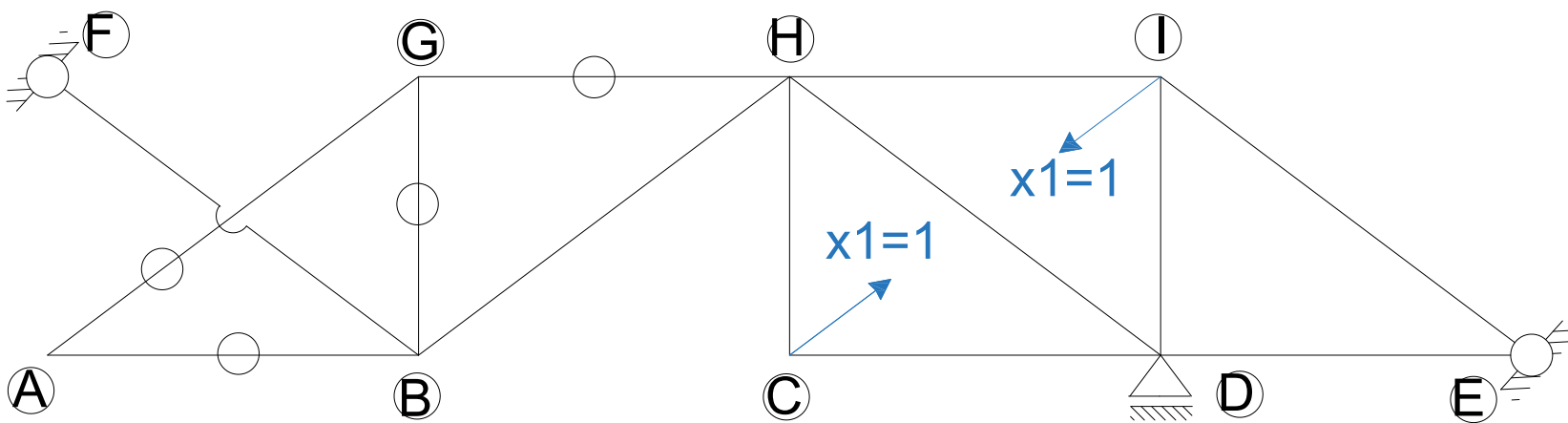
$$\sum R_y = K_2 \sin \alpha + K_3 \sin \alpha = 0$$

$$\downarrow$$

$$K_2 = -K_3$$

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Wykresy: stan $x_1=1$, siły N1



$$\sum R_y = K2 \sin \alpha + K3 \sin \alpha = 0$$

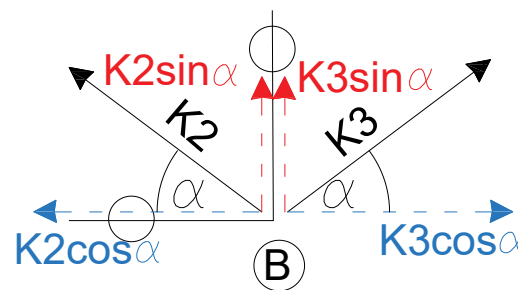
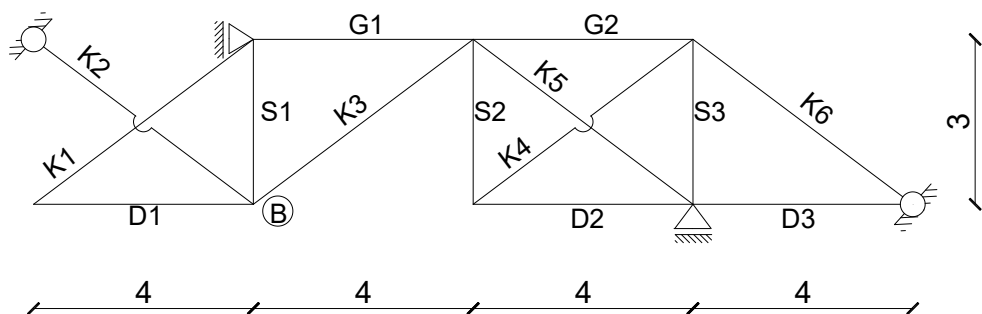
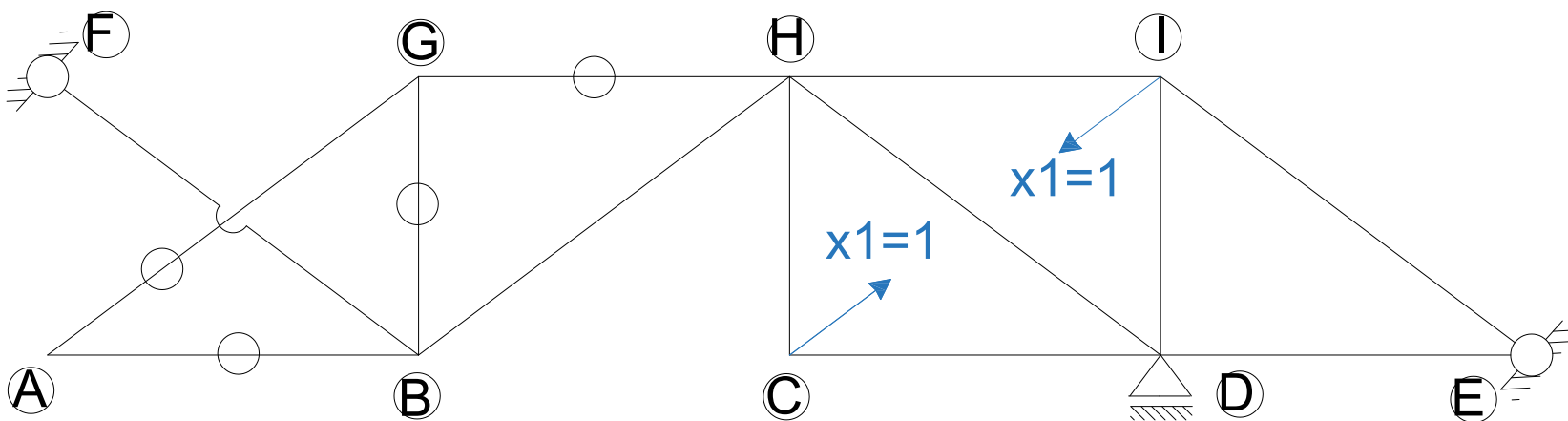


$$K2 = -K3$$

$$\sum R_x = -K2 \cos \alpha + K3 \cos \alpha = 0$$

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Wykresy: stan $x_1=1$, siły N1



$$\sum R_y = K_2 \sin \alpha + K_3 \sin \alpha = 0$$

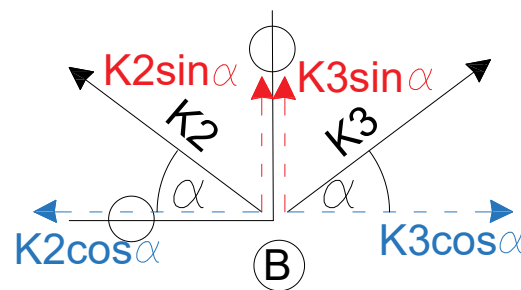
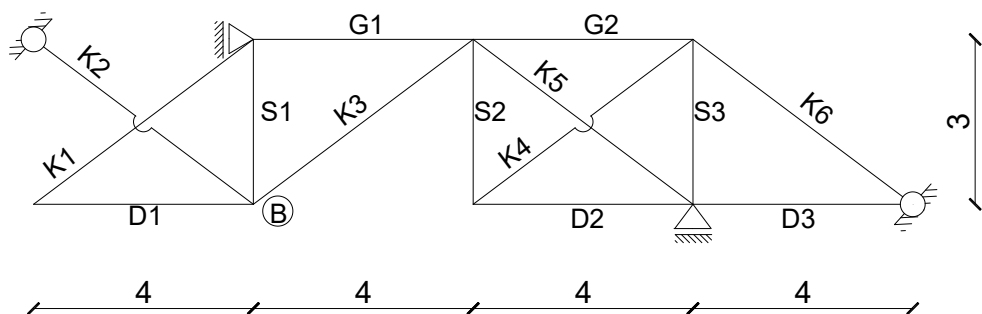
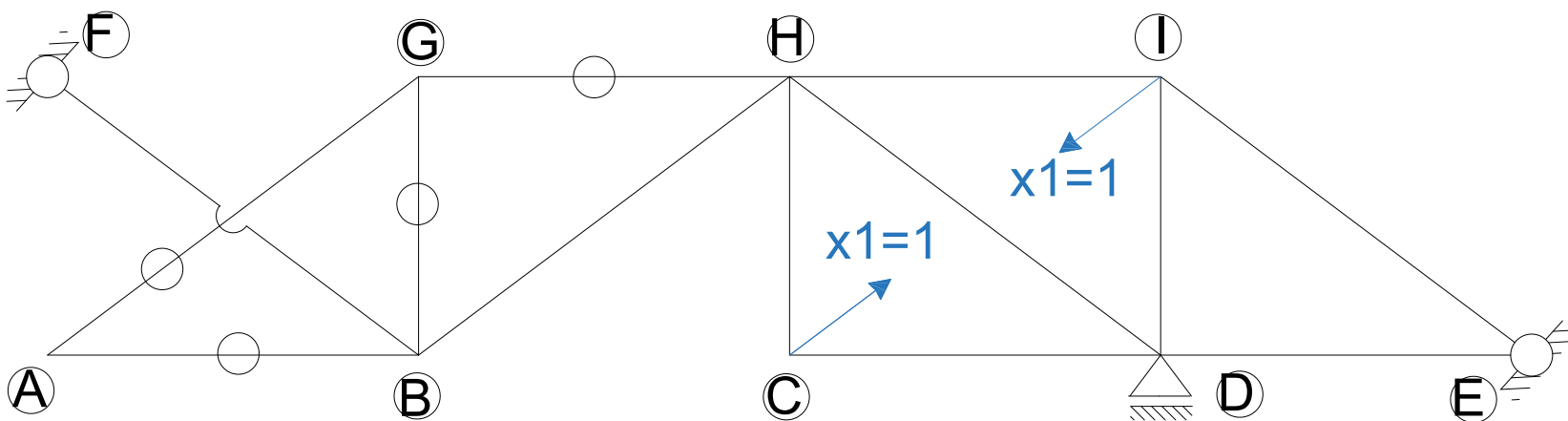
↓

$$K_2 = -K_3$$

$$\begin{aligned} \sum R_x &= -K_2 \cos \alpha + K_3 \cos \alpha = 0 \\ -(-K_3) \cos \alpha + K_3 \cos \alpha &= 0 \end{aligned}$$

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Wykresy: stan $x_1=1$, siły N1



$$\sum R_y = K_2 \sin \alpha + K_3 \sin \alpha = 0$$



$$K_2 = -K_3$$

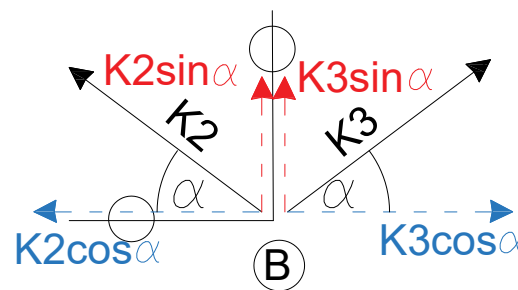
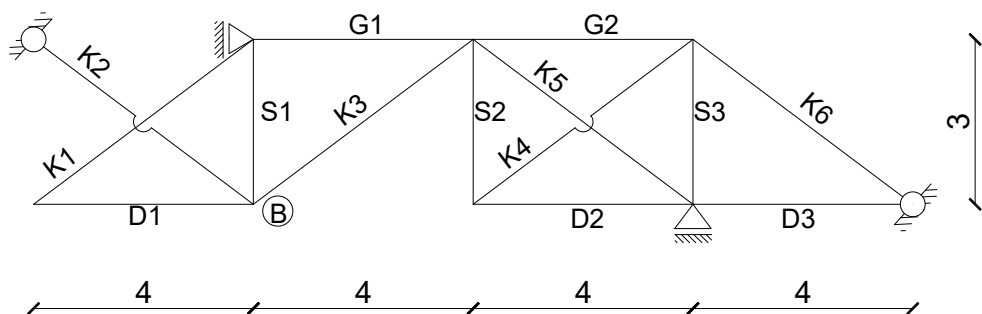
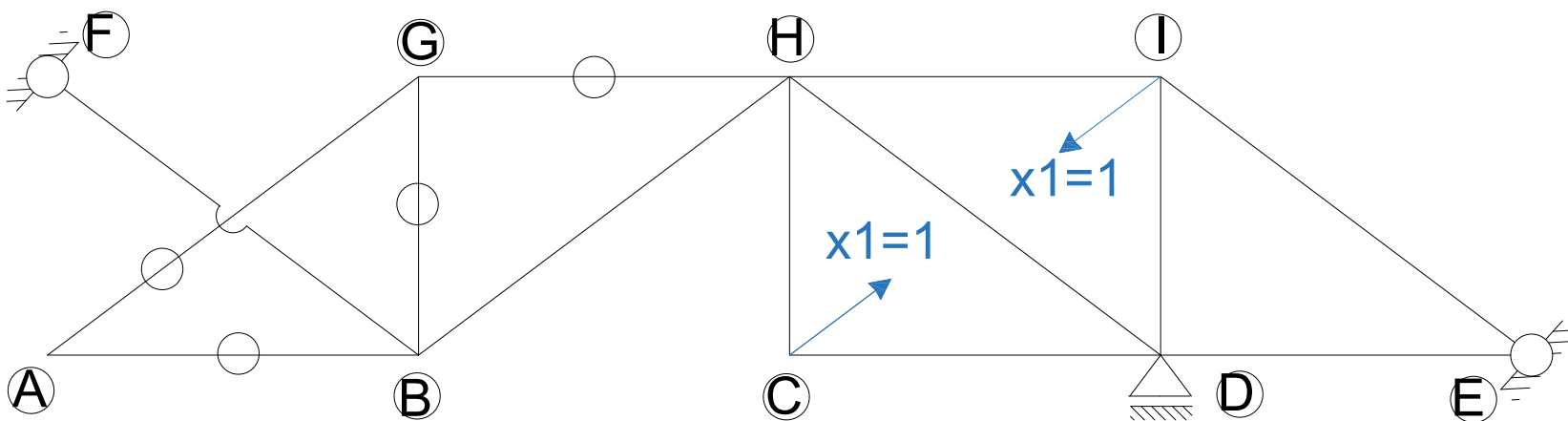
$$\sum R_x = -K_2 \cos \alpha + K_3 \cos \alpha = 0$$

$$-(-K_3) \cos \alpha + K_3 \cos \alpha = 0$$

$$2 \cdot K_3 \cos \alpha = 0$$

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Wykresy: stan $x_1=1$, siły N1



$$\sum R_y = K_2 \sin \alpha + K_3 \sin \alpha = 0$$



$$K_2 = -K_3$$

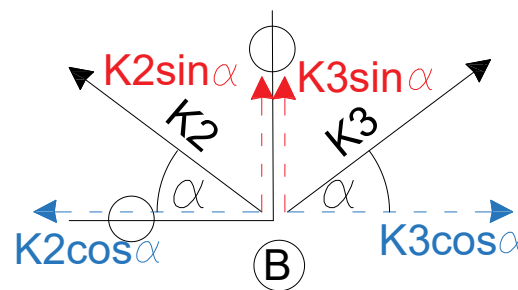
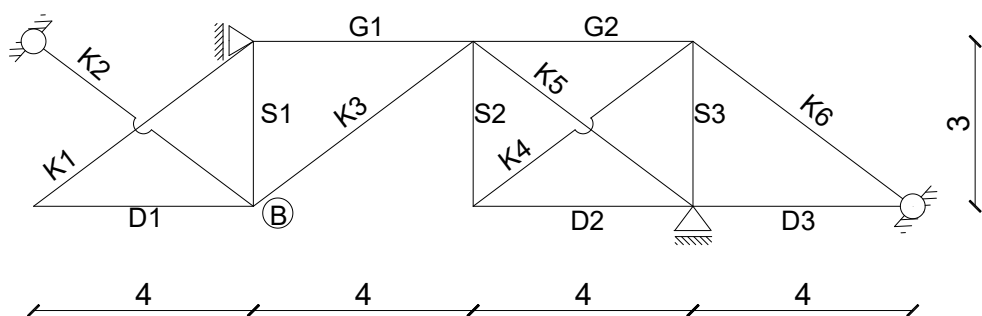
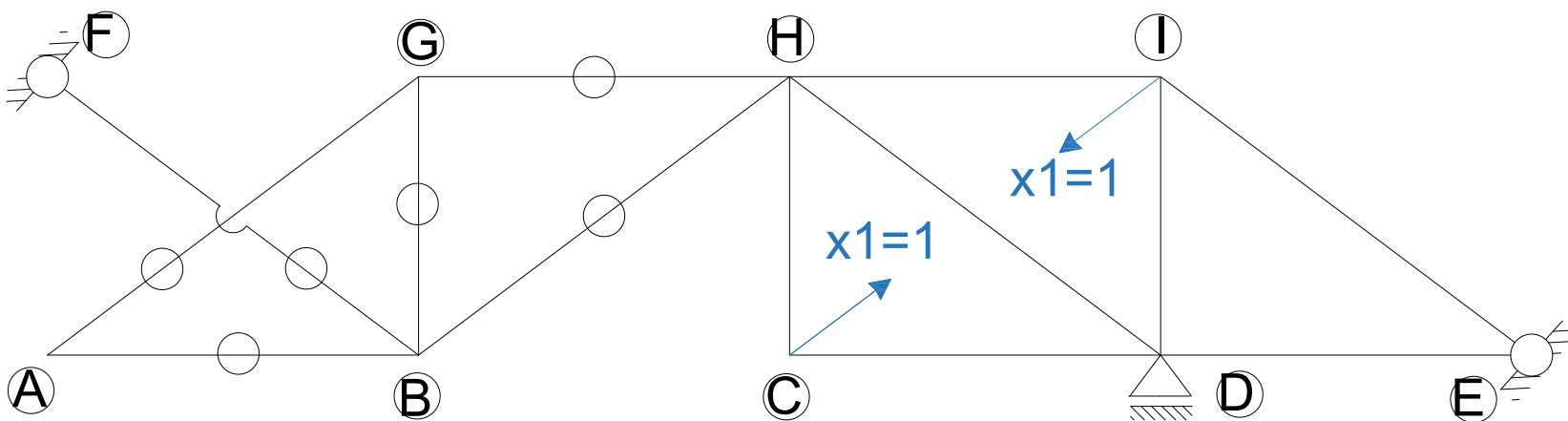
$$\sum R_x = -K_2 \cos \alpha + K_3 \cos \alpha = 0$$

$$-(-K_3) \cos \alpha + K_3 \cos \alpha = 0$$

$$2 \cdot K_3 \cos \alpha = 0$$

$$K_3 = 0$$

Wykresy: stan $x_1=1$, siły N1



$$\sum R_y = K_2 \sin \alpha + K_3 \sin \alpha = 0$$

↓

$$K_2 = -K_3$$

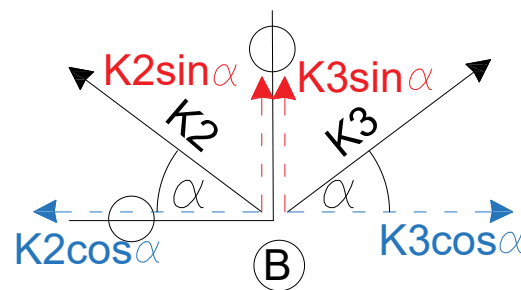
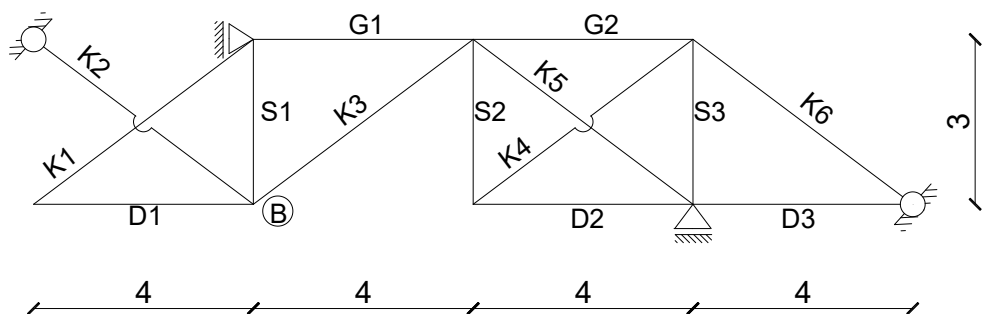
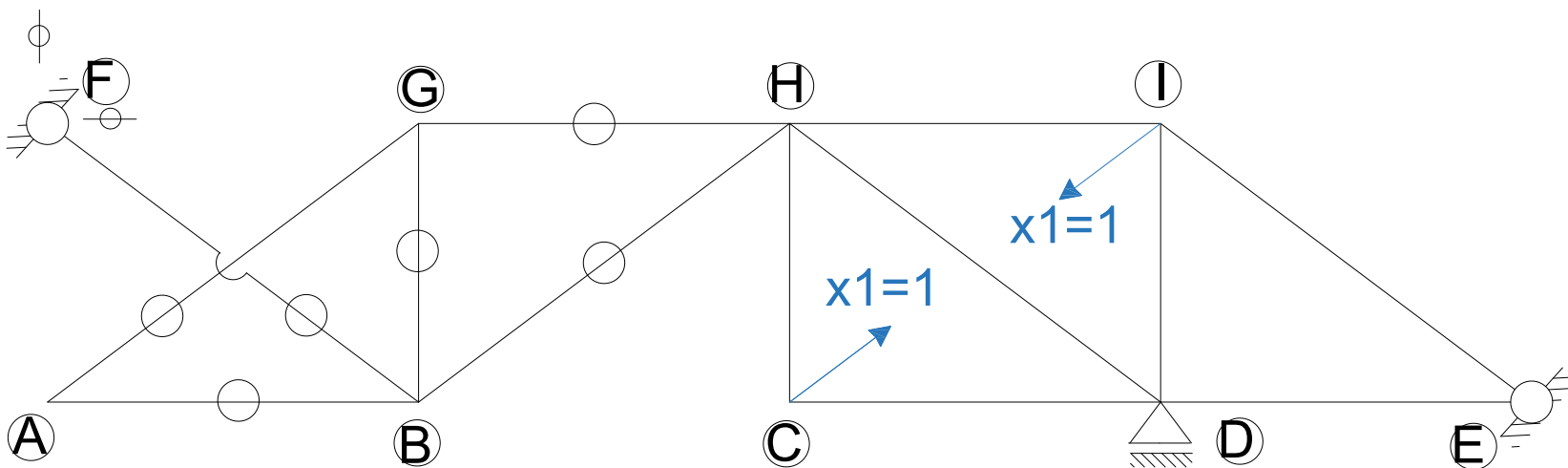
$$\sum R_x = -K_2 \cos \alpha + K_3 \cos \alpha = 0$$

$$-(-K_3) \cos \alpha + K_3 \cos \alpha = 0$$

$$2 \cdot K_3 \cos \alpha = 0$$

$$K_3 = 0$$

Wykresy: stan $x_1=1$, siły N1



$$\sum R_y = K_2 \sin \alpha + K_3 \sin \alpha = 0$$

↓

$$K_2 = -K_3$$

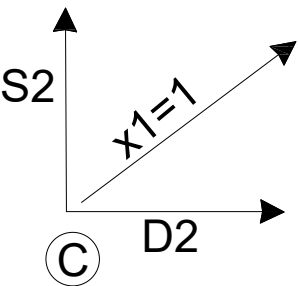
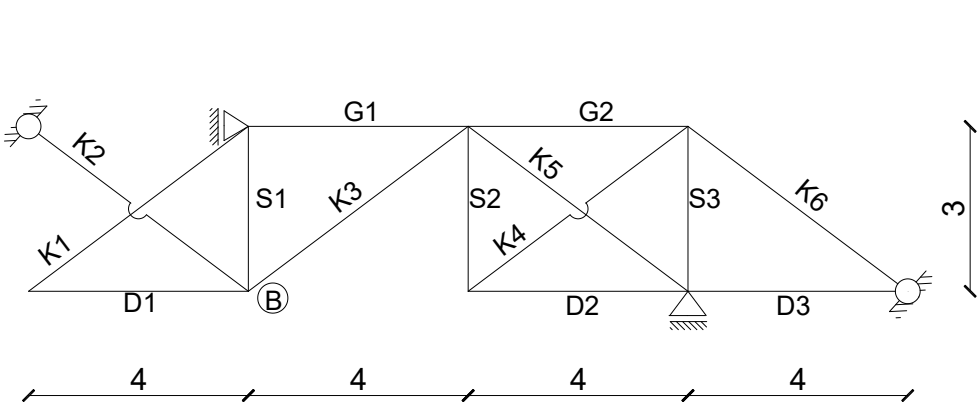
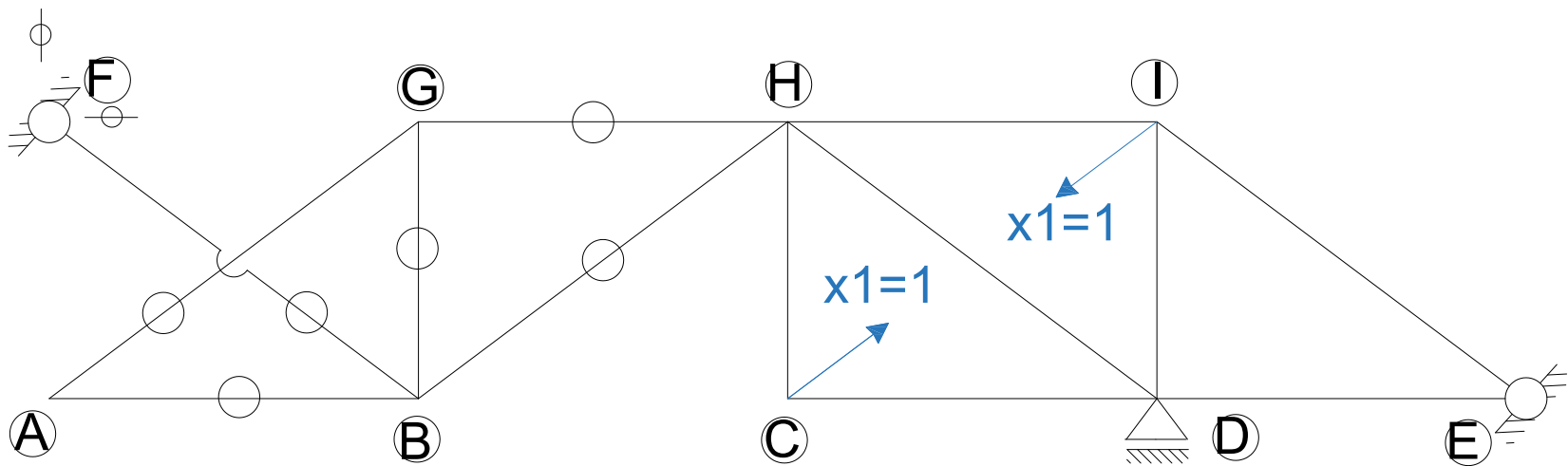
$$\sum R_x = -K_2 \cos \alpha + K_3 \cos \alpha = 0$$

$$-(-K_3) \cos \alpha + K_3 \cos \alpha = 0$$

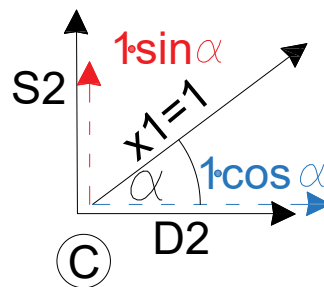
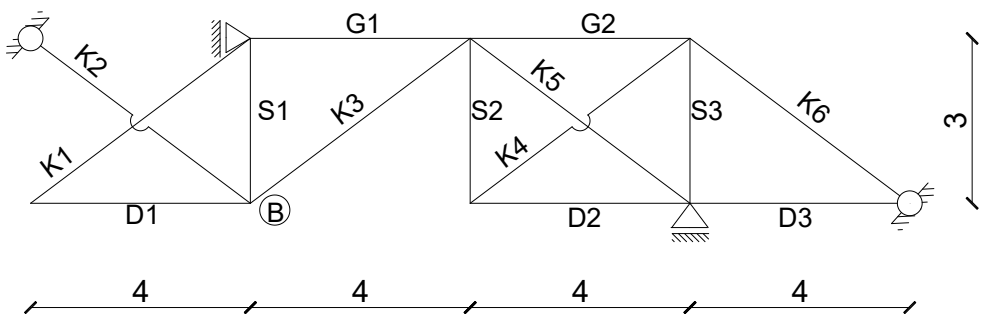
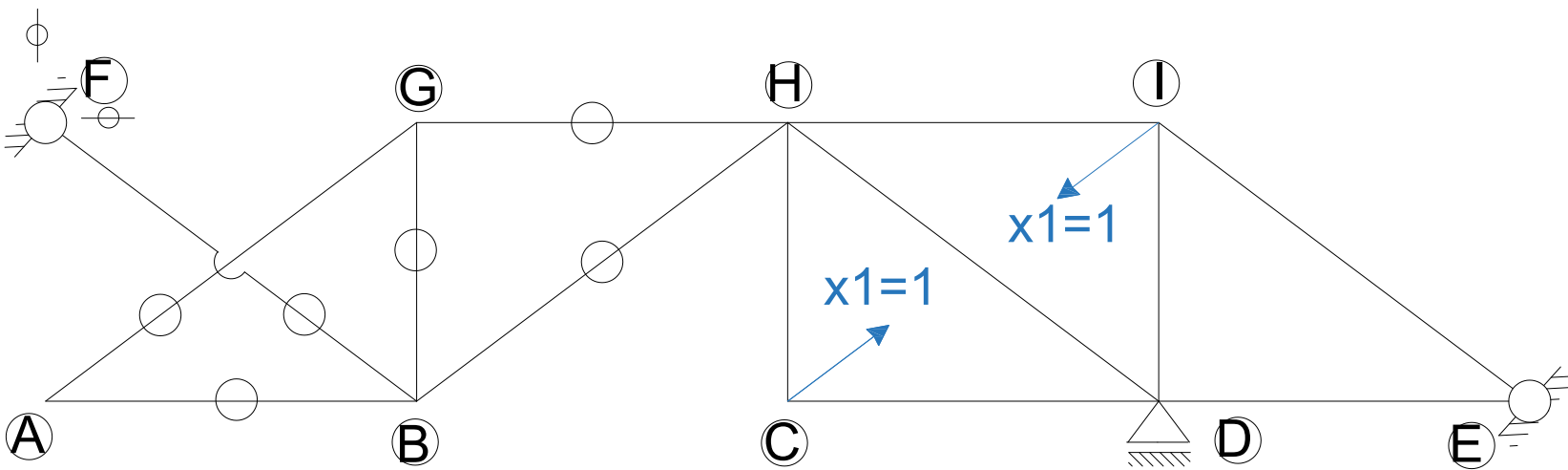
$$2 \cdot K_3 \cos \alpha = 0$$

$$K_3 = 0$$

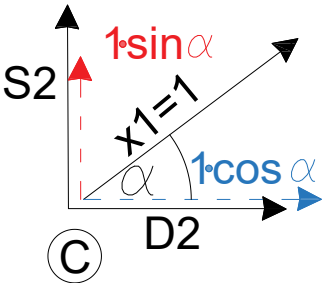
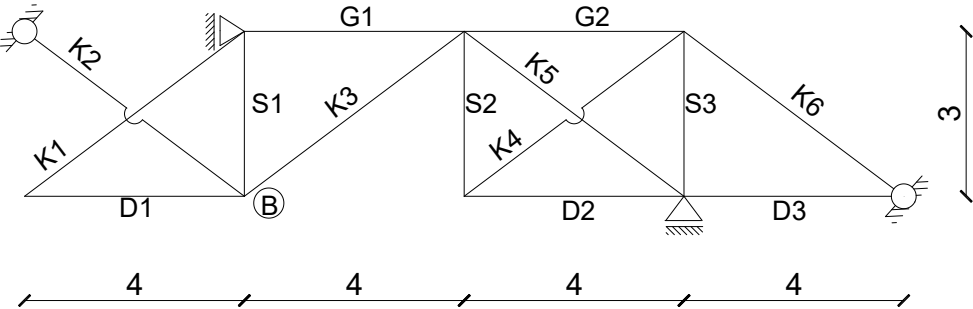
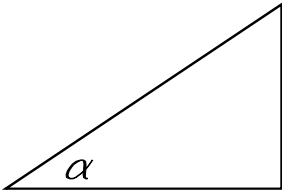
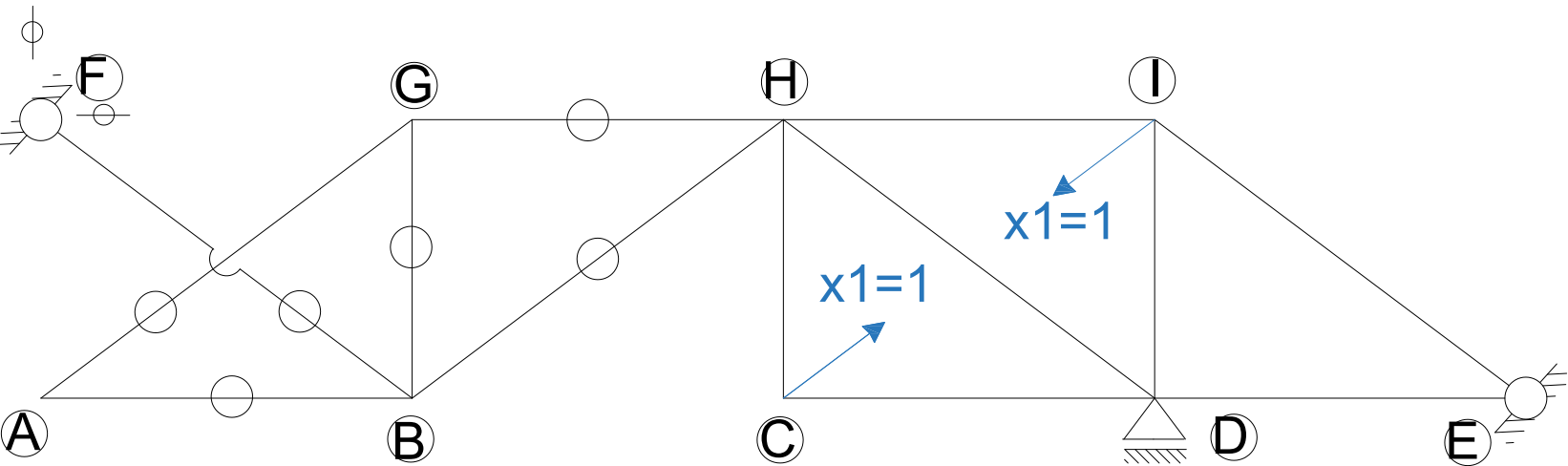
Wykresy: stan $x_1=1$, siły N1



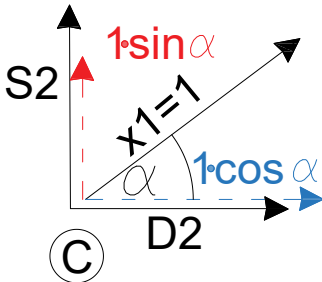
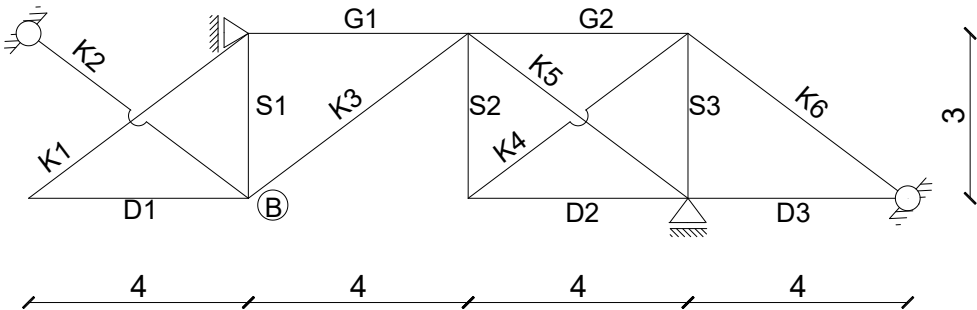
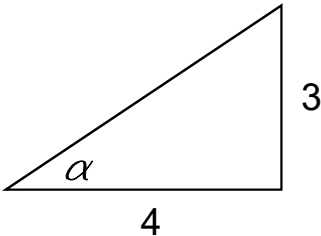
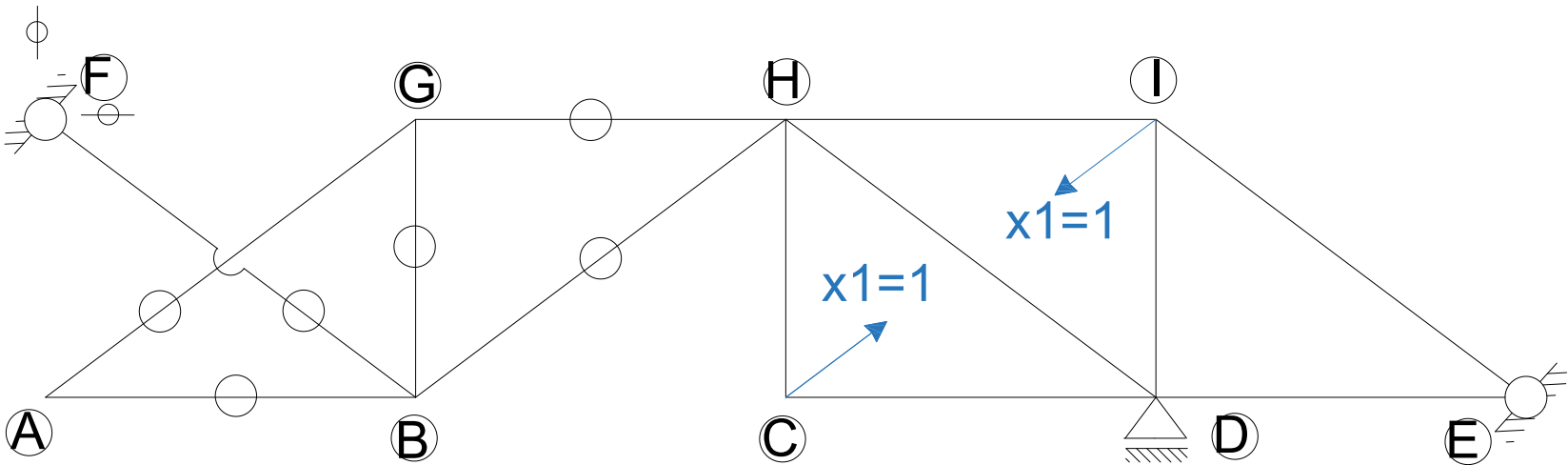
Wykresy: stan $x_1=1$, siły N_1



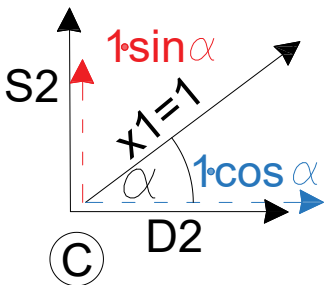
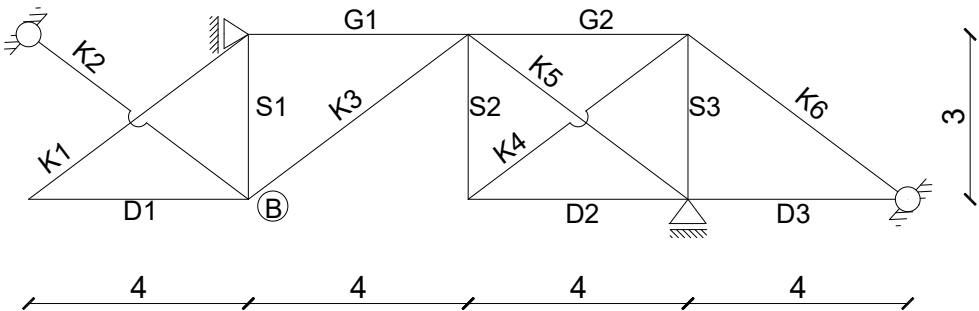
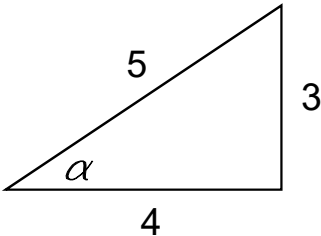
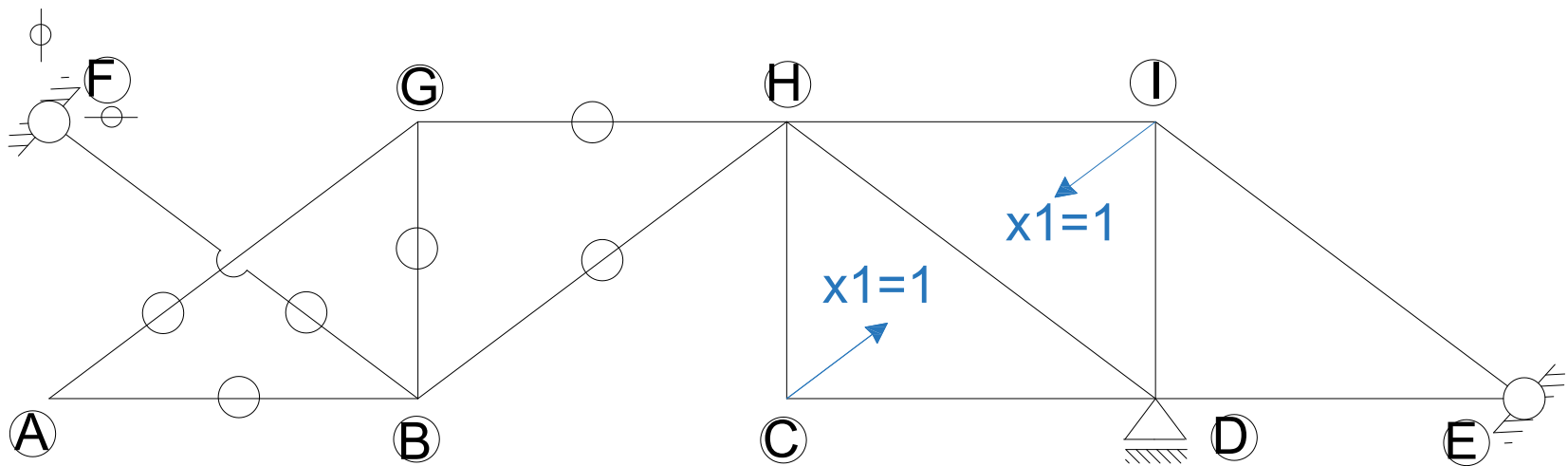
Wykresy: stan $x_1=1$, siły N1



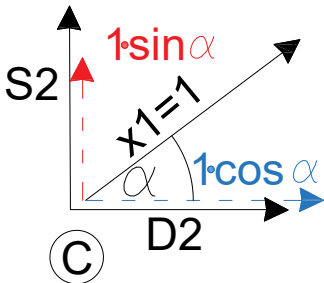
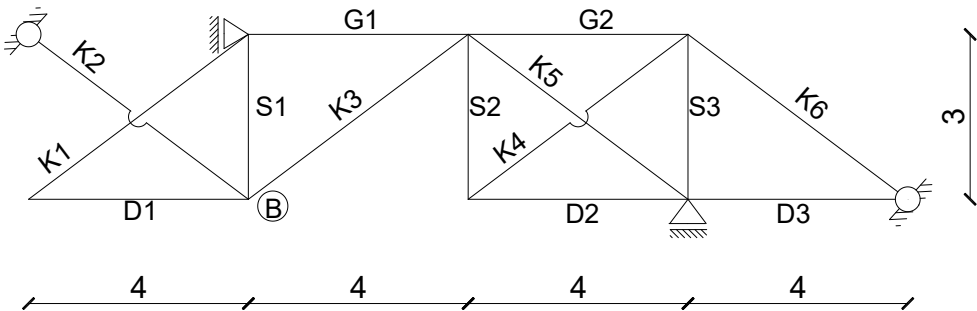
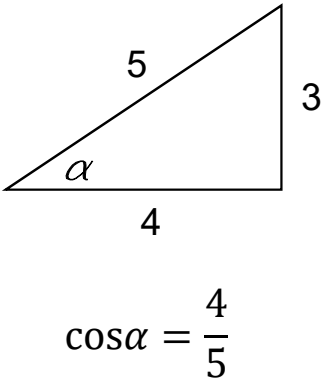
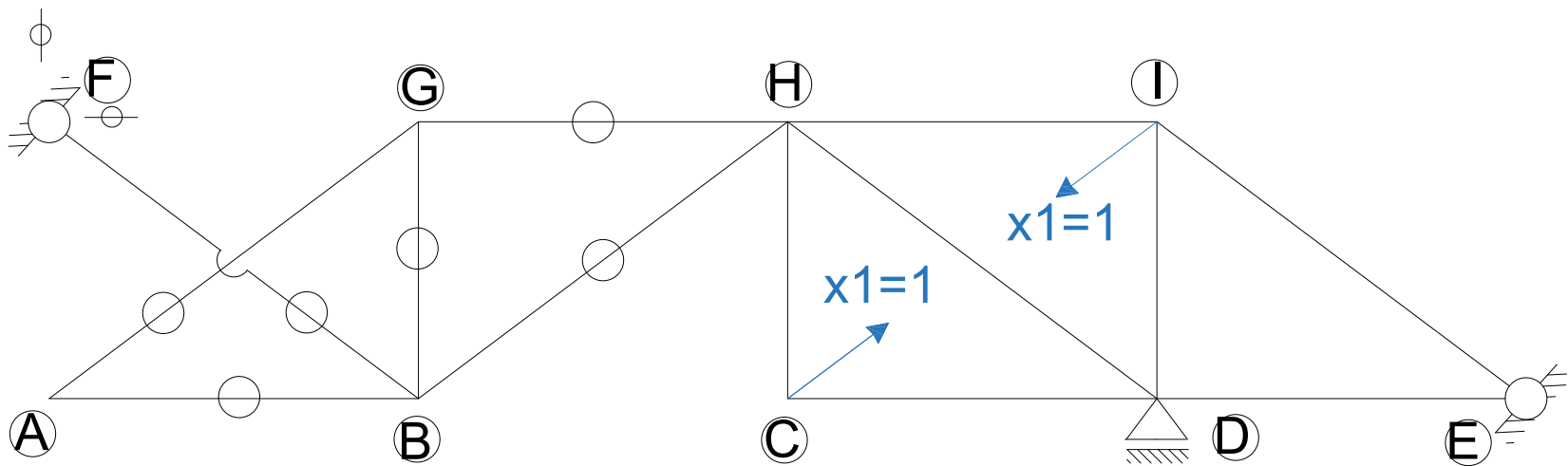
Wykresy: stan $x_1=1$, siły N1



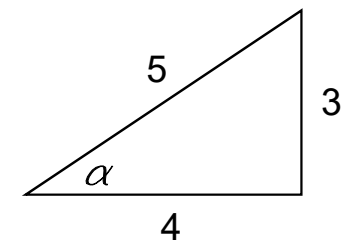
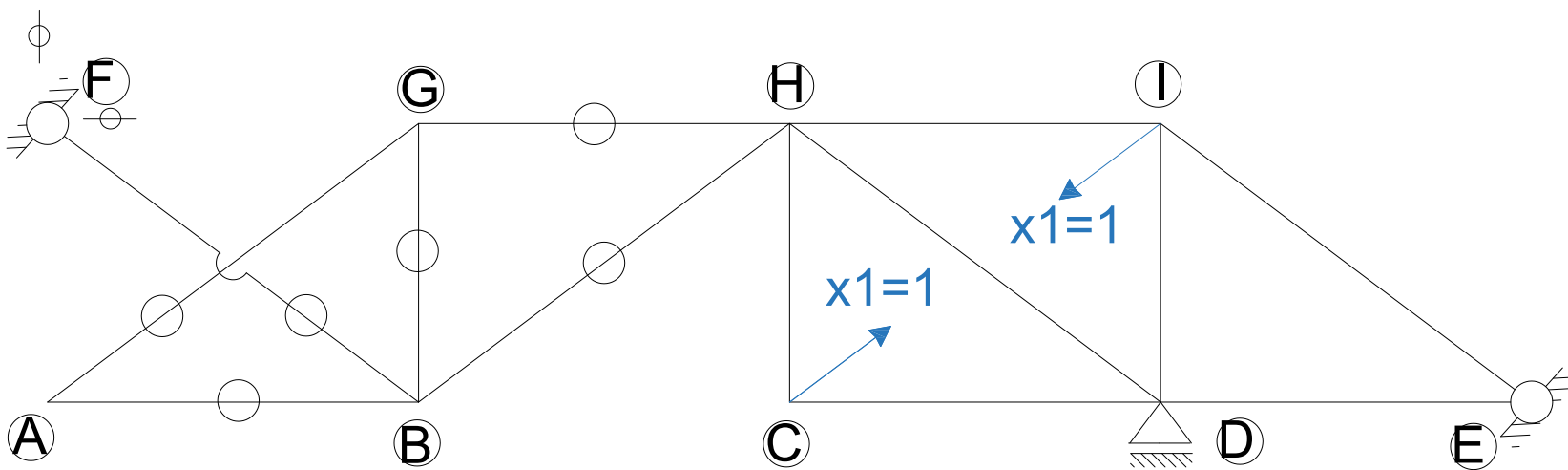
Wykresy: stan $x_1=1$, siły N1



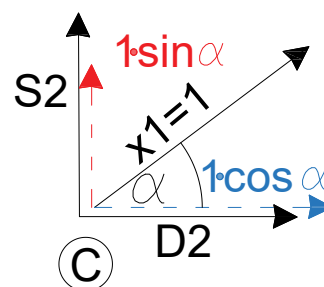
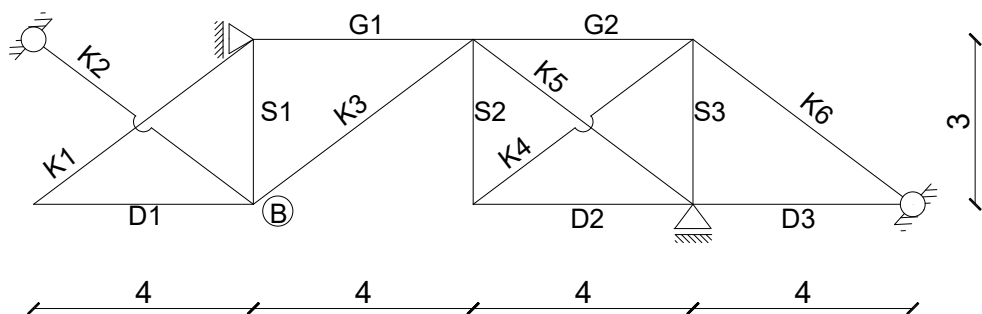
Wykresy: stan $x_1=1$, siły N1



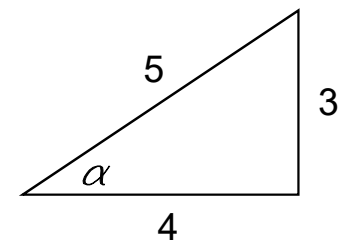
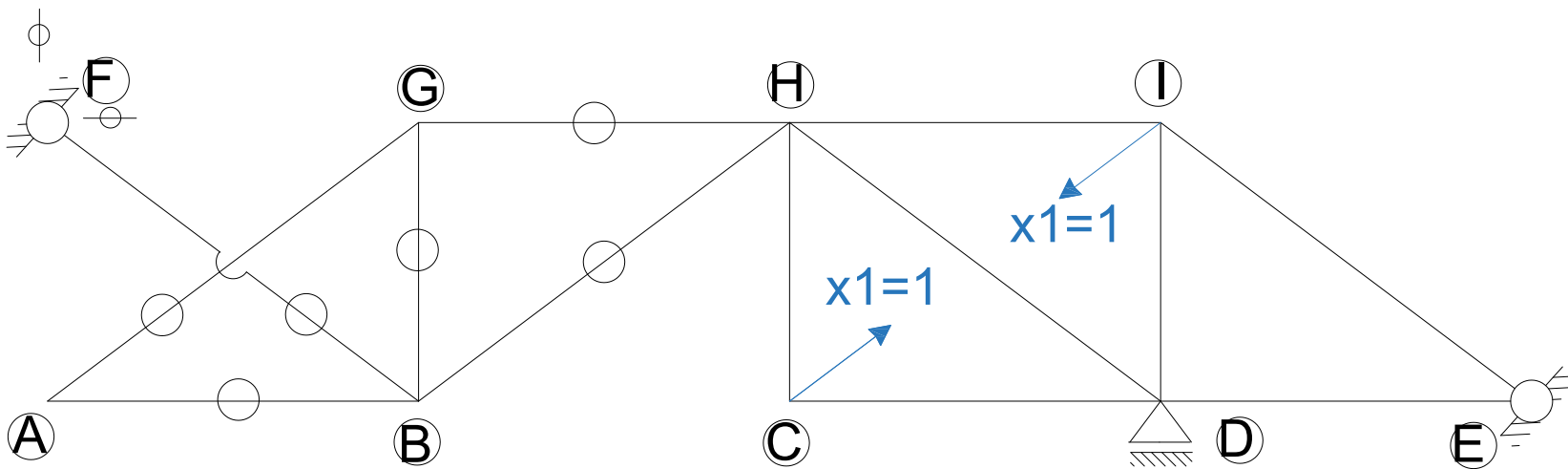
Wykresy: stan $x_1=1$, siły N1



$$\cos \alpha = \frac{4}{5} = 0,8$$

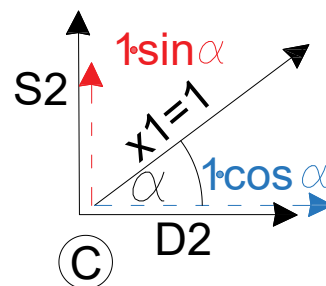
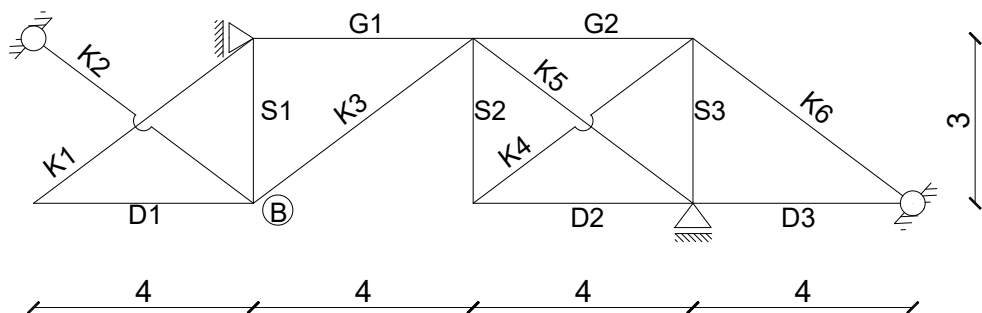


Wykresy: stan $x_1=1$, siły N1

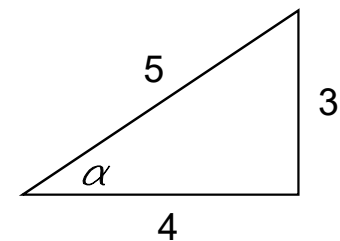
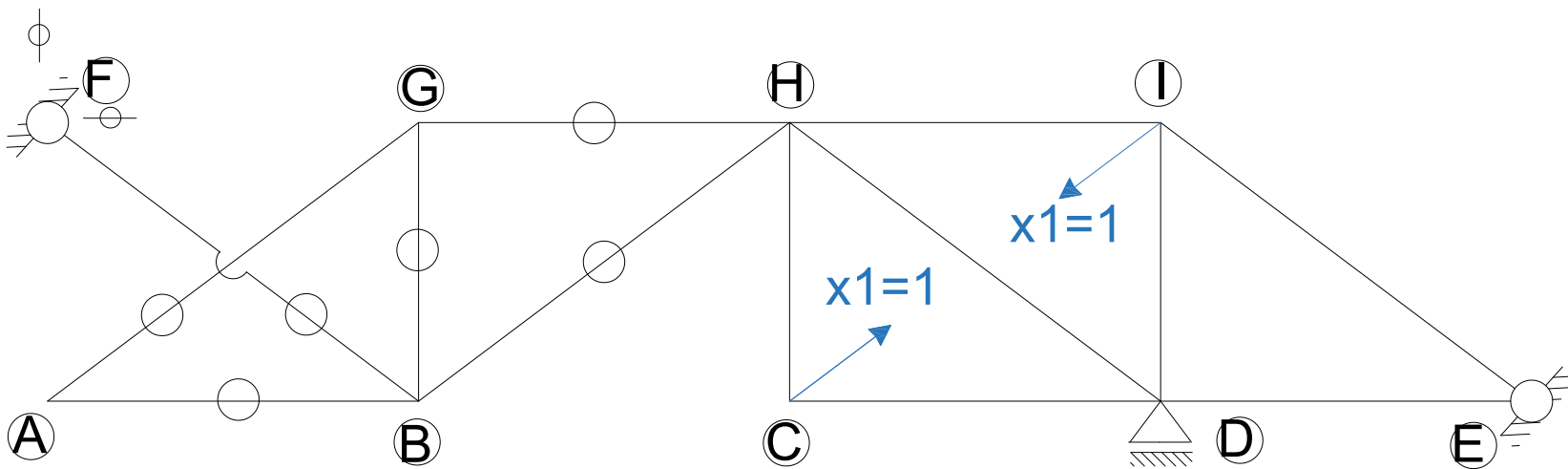


$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5}$$

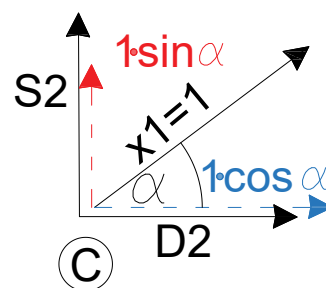
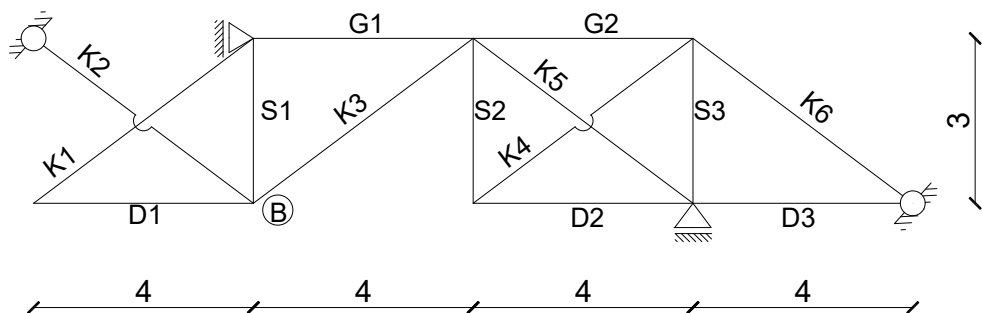


Wykresy: stan $x_1=1$, siły N1

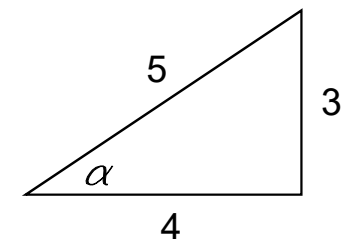
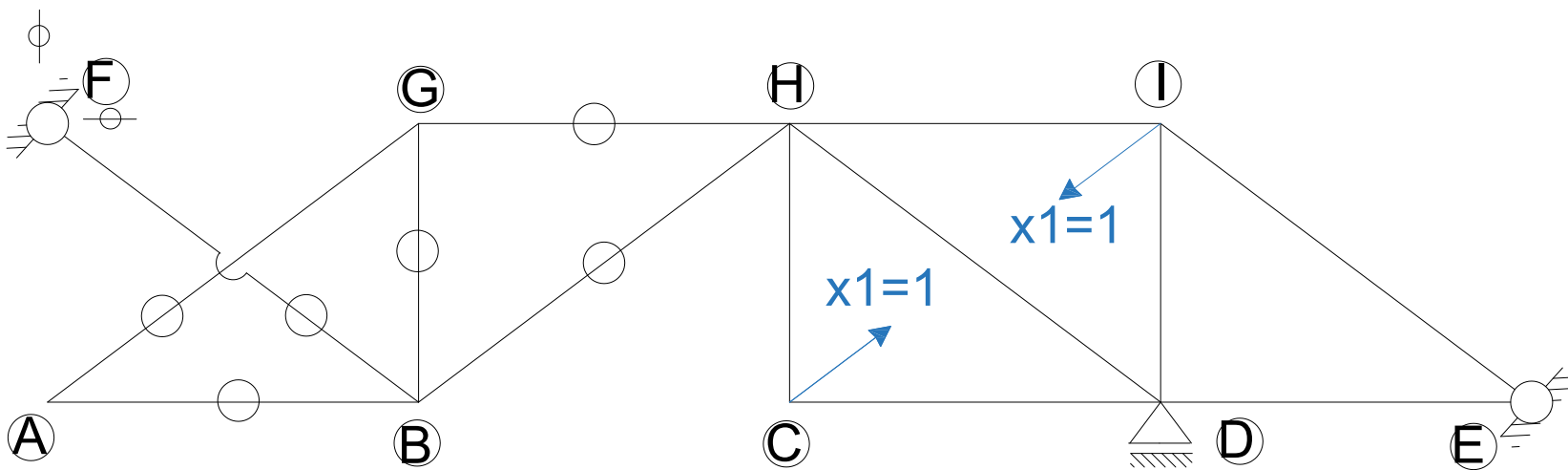


$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$

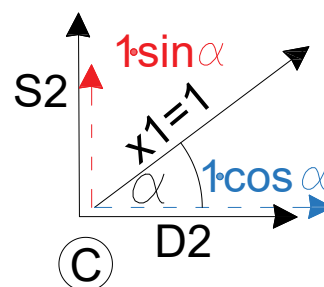
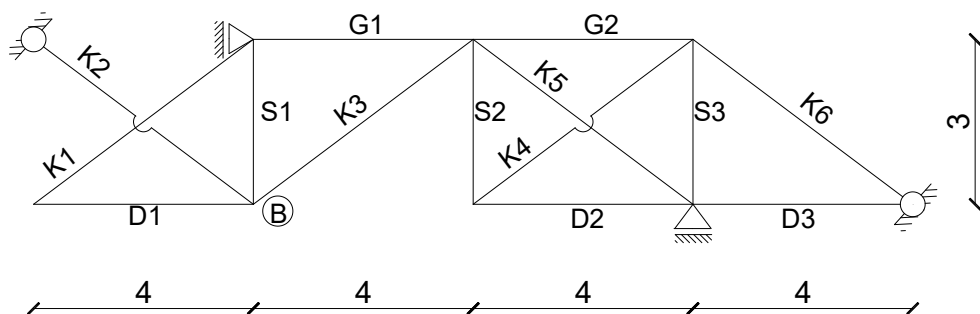


Wykresy: stan $x_1=1$, siły N1



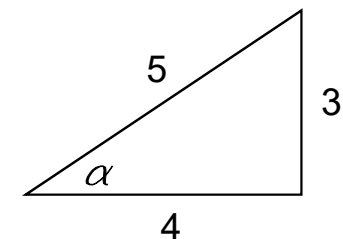
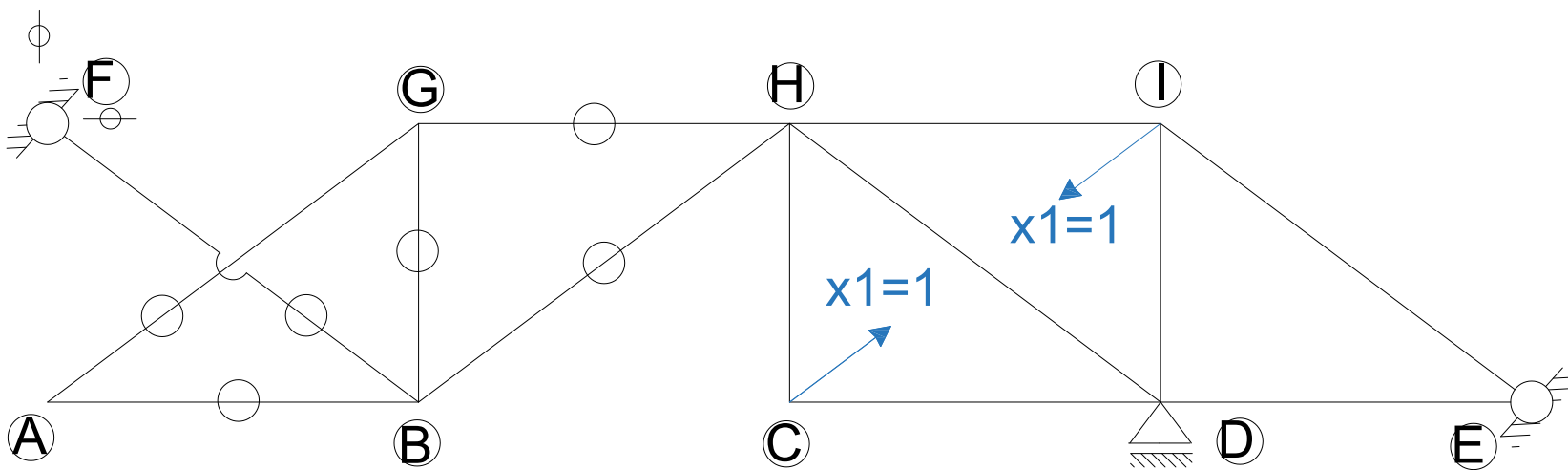
$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$



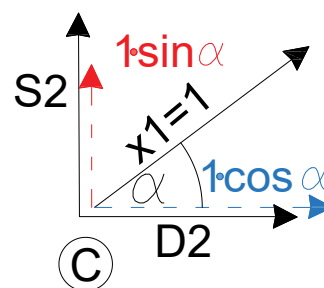
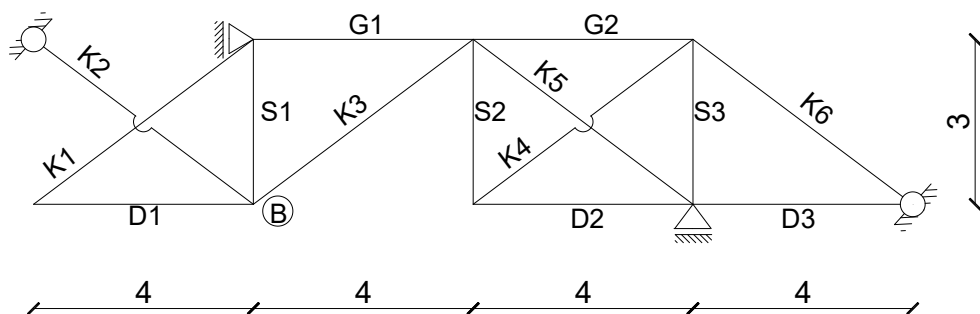
$$\sum R_y = S_2 + x_1 \cdot \sin \alpha = 0$$

Wykresy: stan $x_1=1$, siły N1



$$\cos \alpha = \frac{4}{5} = 0,8$$

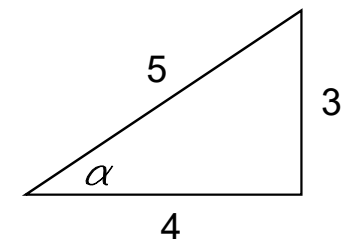
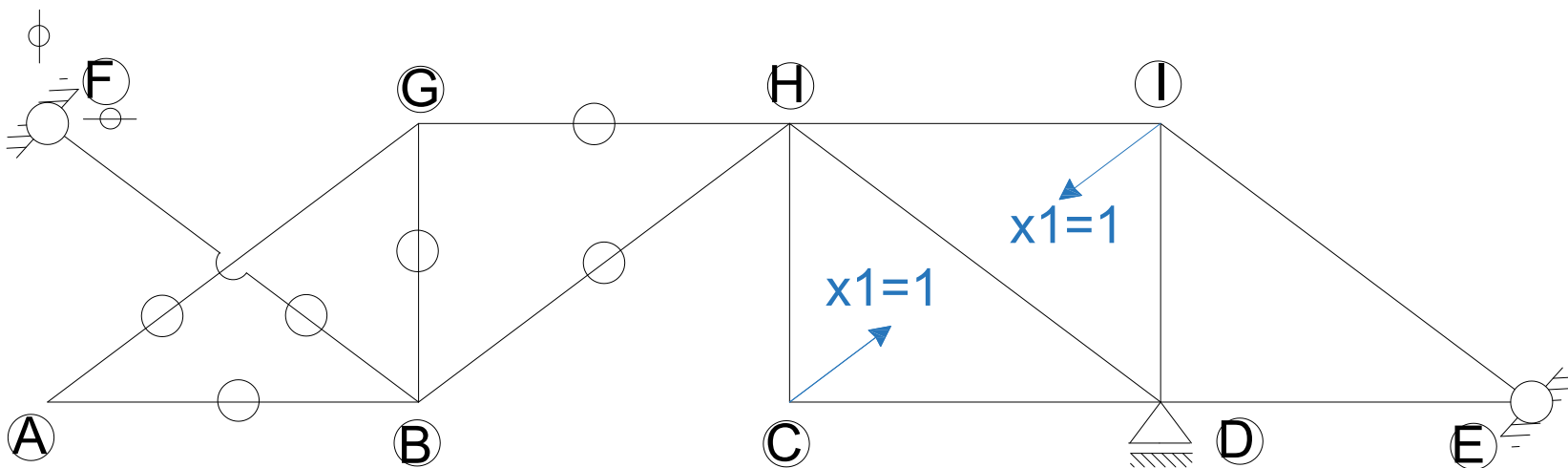
$$\sin \alpha = \frac{3}{5} = 0,6$$



$$\sum R_y = S_2 + x_1 \cdot \sin \alpha = 0$$

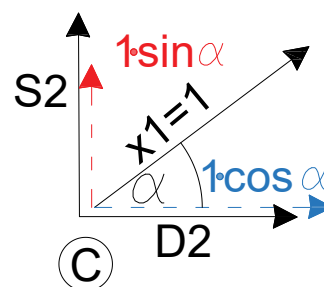
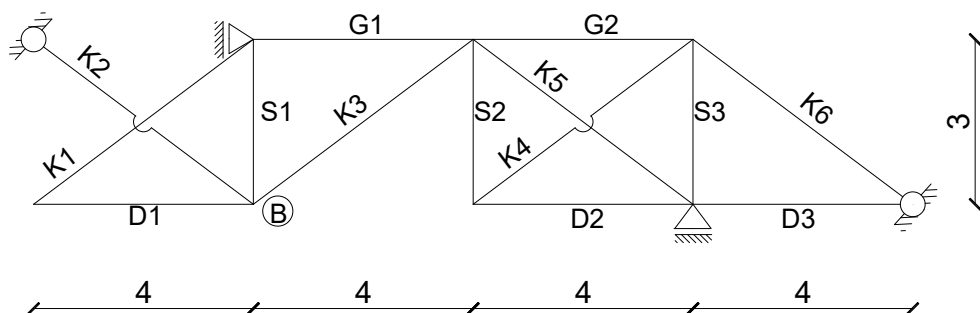


Wykresy: stan $x_1=1$, siły N1



$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$

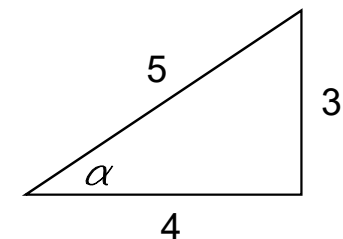
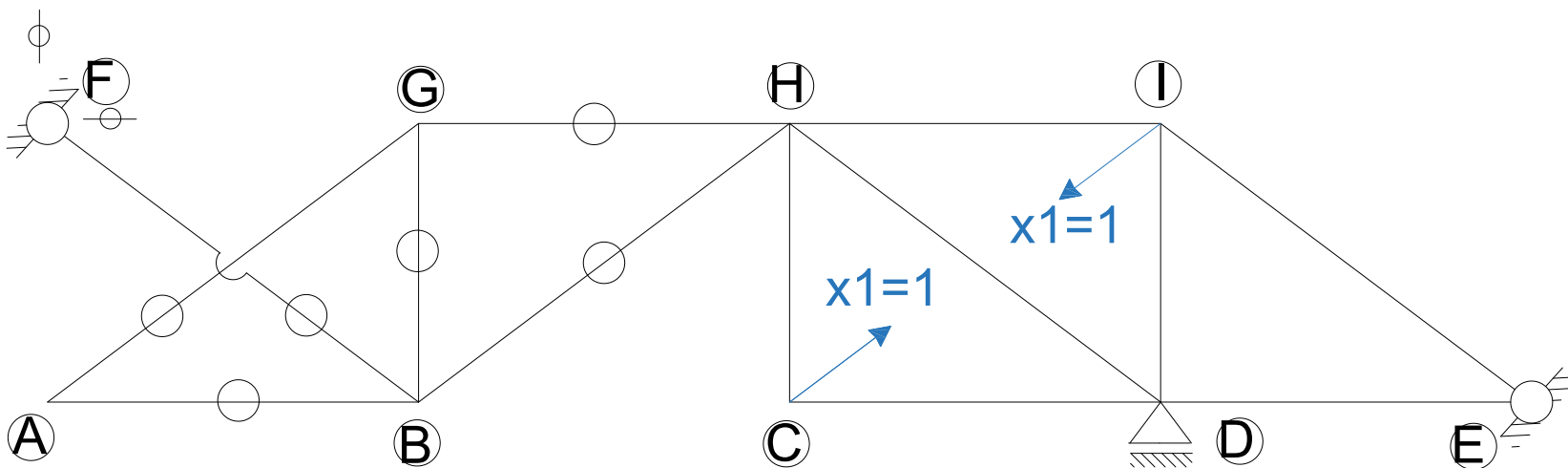


$$\sum R_y = S2 + x1 \cdot \sin \alpha = 0$$

$$\downarrow$$

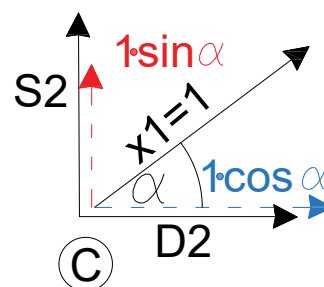
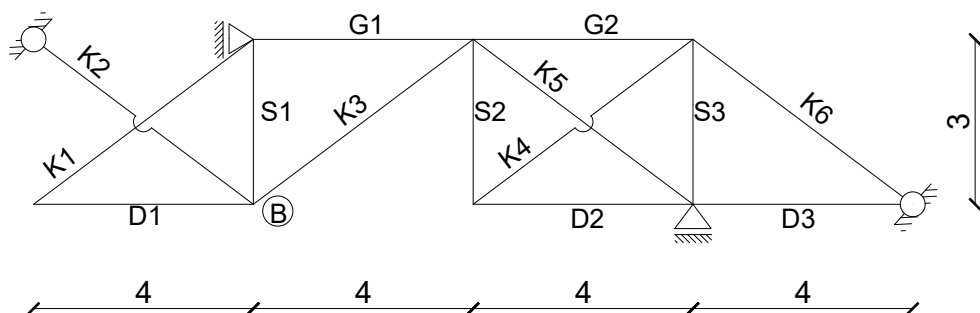
$$S2 = -x1 \cdot \sin \alpha = -1 \cdot \frac{3}{5} = -0,6$$

Wykresy: stan $x_1=1$, siły N1



$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$



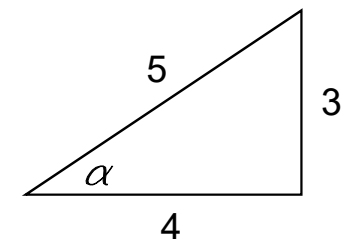
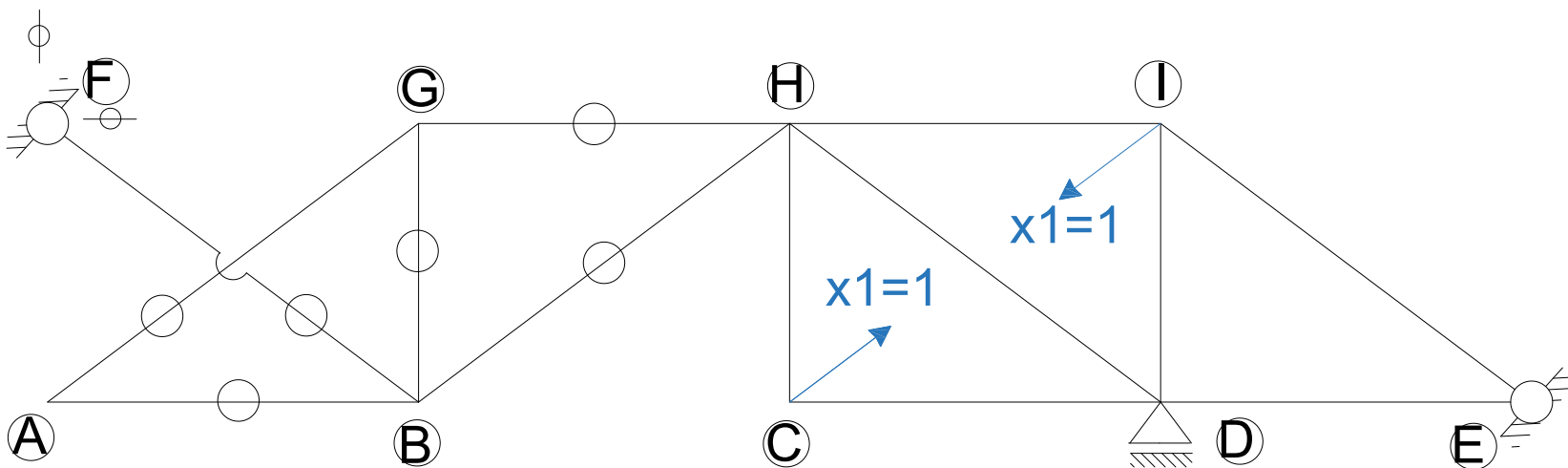
$$\sum R_y = S2 + x1 \cdot \sin \alpha = 0$$



$$S2 = -x1 \cdot \sin \alpha = -1 \cdot \frac{3}{5} = -0,6$$

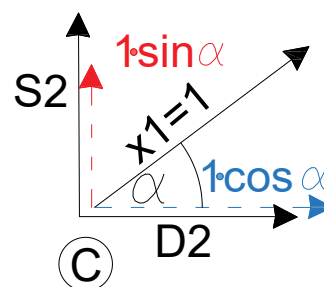
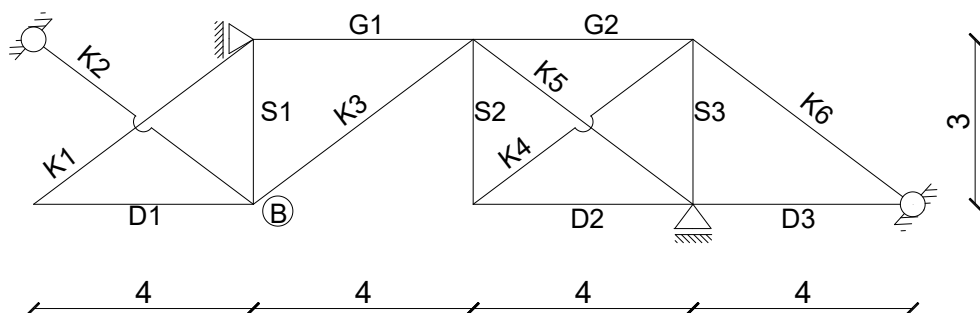
$$\sum R_x = D2 + x1 \cdot \cos \alpha = 0$$

Wykresy: stan $x_1=1$, siły N1



$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$



$$\sum R_y = S2 + x1 \cdot \sin \alpha = 0$$



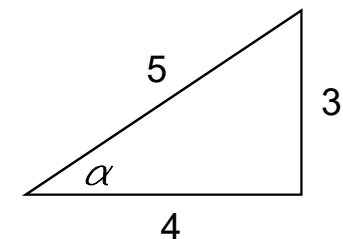
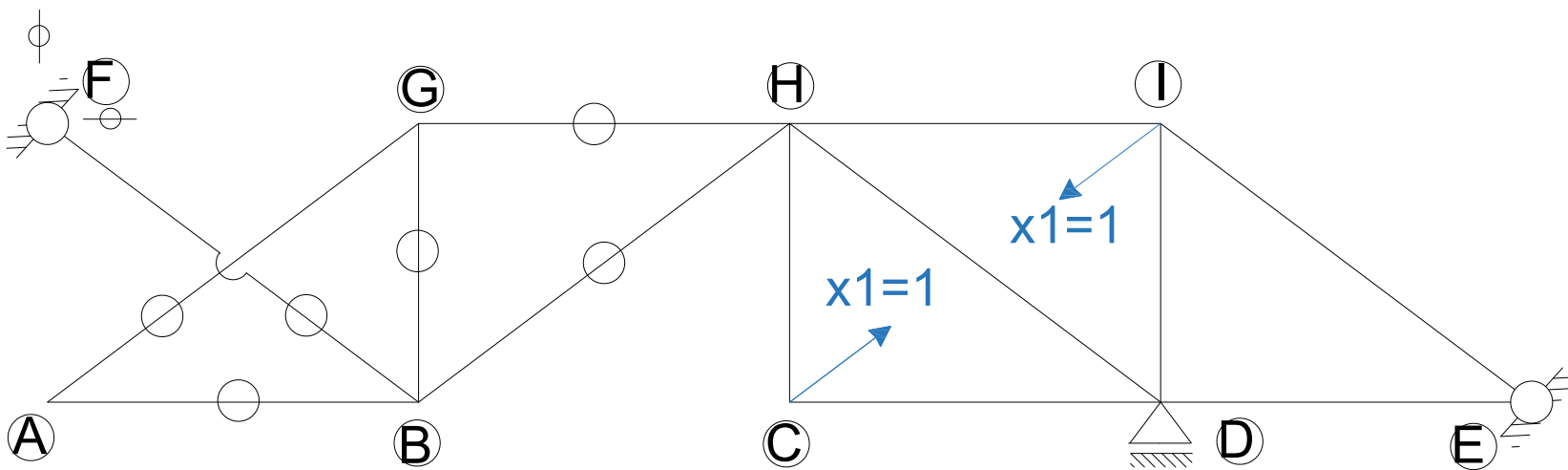
$$S2 = -x1 \cdot \sin \alpha = -1 \cdot \frac{3}{5} = -0,6$$

$$\sum R_x = D2 + x1 \cdot \cos \alpha = 0$$



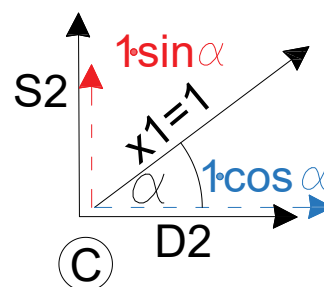
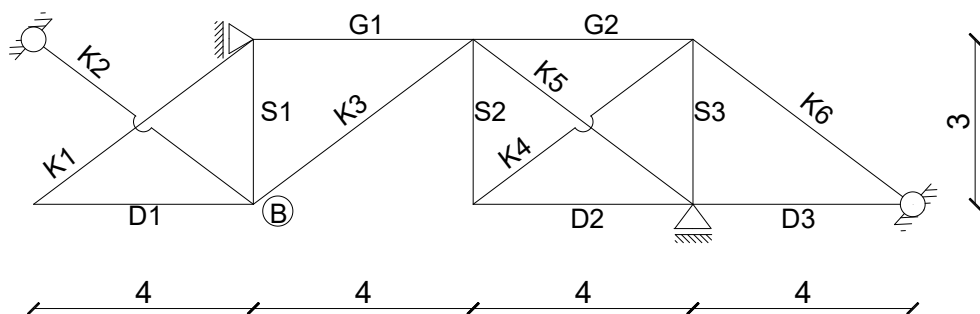
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Wykresy: stan $x_1=1$, siły N1



$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$



$$\sum R_y = S2 + x1 \cdot \sin \alpha = 0$$



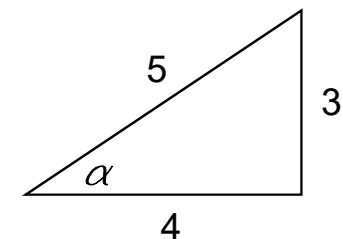
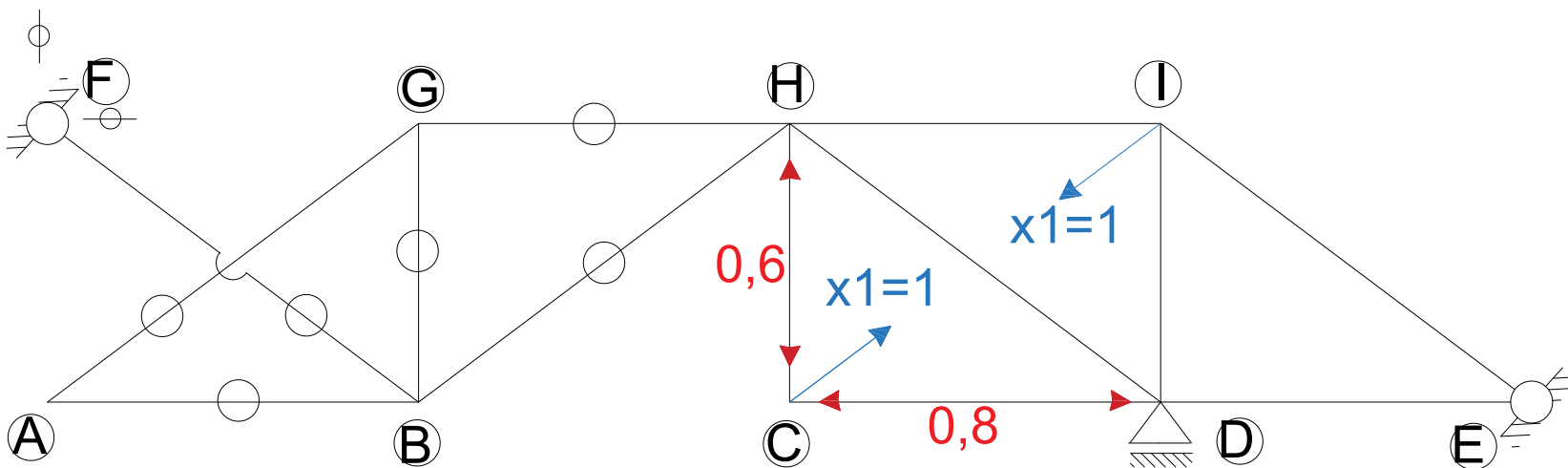
$$S2 = -x1 \cdot \sin \alpha = -1 \cdot \frac{3}{5} = -0,6$$

$$\sum R_x = D2 + x1 \cdot \cos \alpha = 0$$



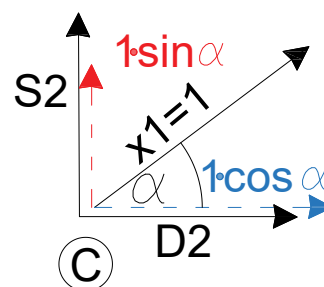
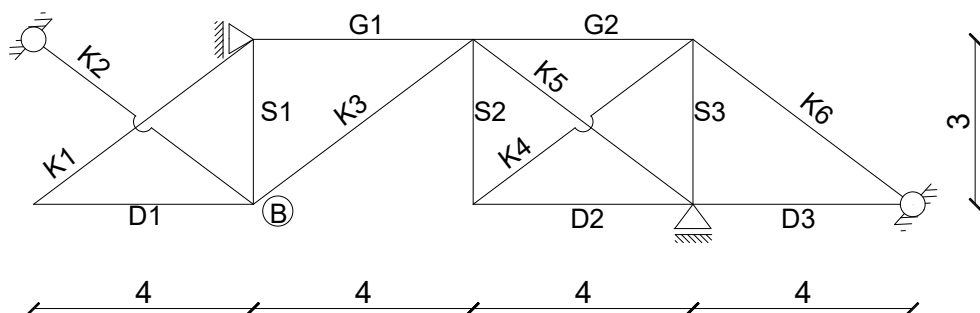
$$D2 = -x1 \cdot \cos \alpha = -1 \cdot \frac{4}{5} = -0,8$$

Wykresy: stan $x_1=1$, siły N1



$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$



$$\sum R_y = S_2 + x_1 \cdot \sin \alpha = 0$$



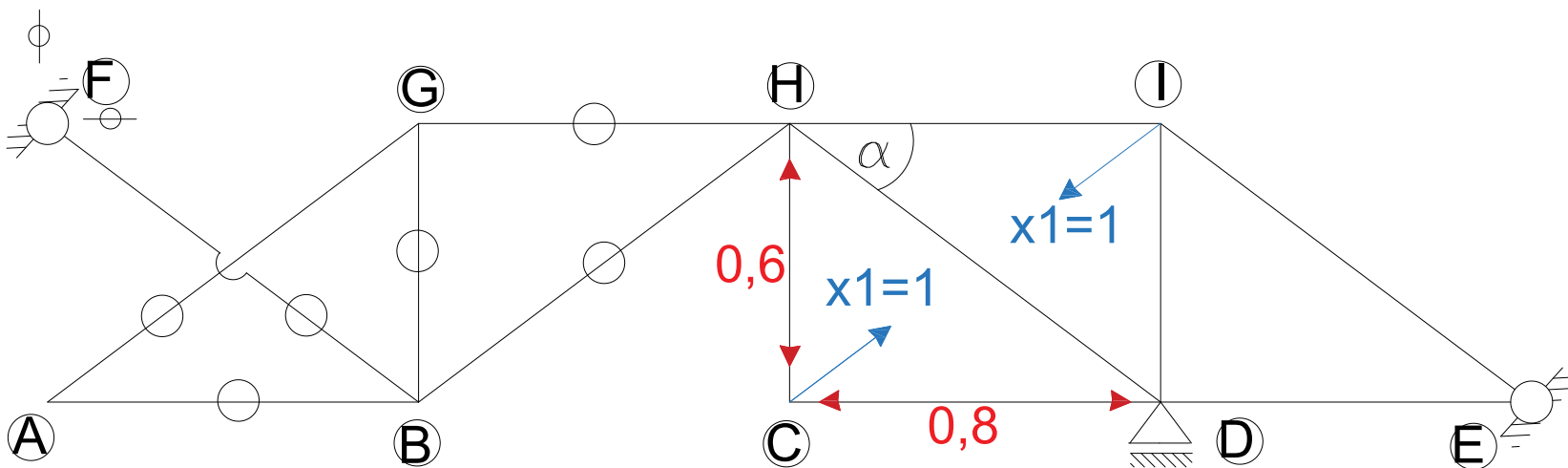
$$S_2 = -x_1 \cdot \sin \alpha = -1 \cdot \frac{3}{5} = -0,6$$

$$\sum R_x = D_2 + x_1 \cdot \cos \alpha = 0$$



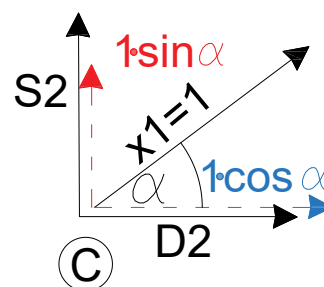
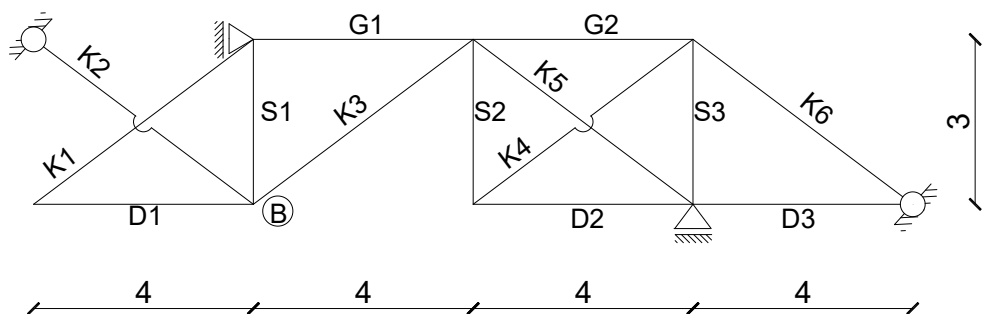
$$D_2 = -x_1 \cdot \cos \alpha = -1 \cdot \frac{4}{5} = -0,8$$

Wykresy: stan $x_1=1$, siły N1



$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$



$$\sum R_y = S_2 + x_1 \cdot \sin \alpha = 0$$



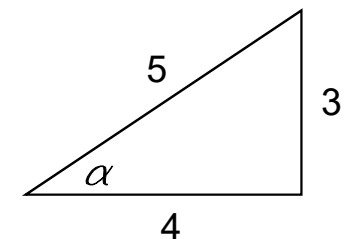
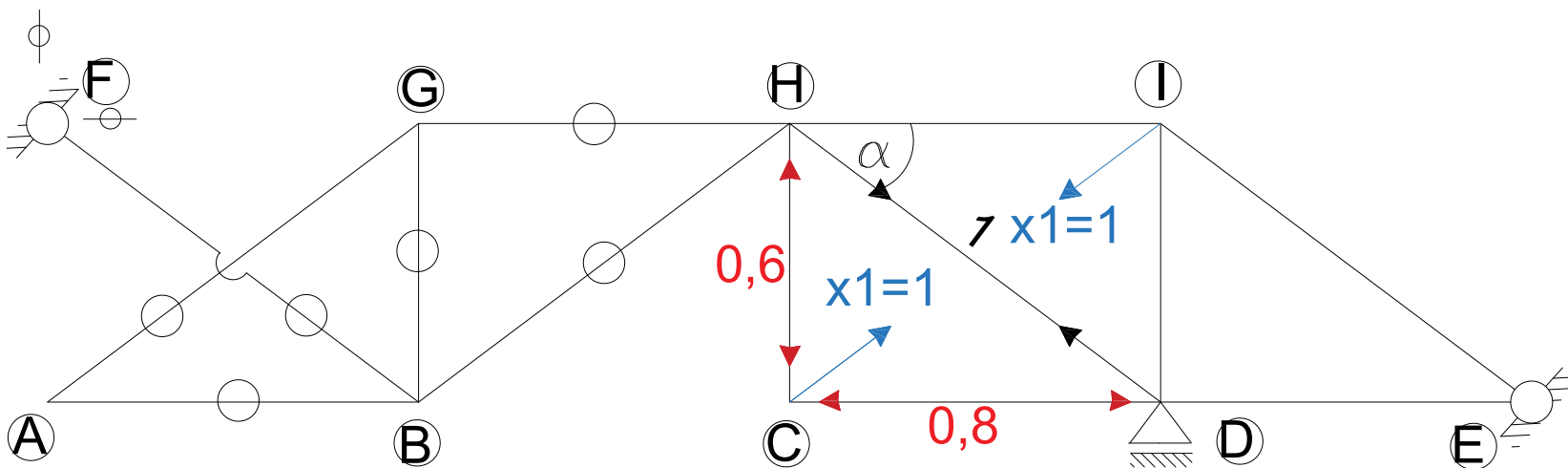
$$S_2 = -x_1 \cdot \sin \alpha = -1 \cdot \frac{3}{5} = -0,6$$

$$\sum R_x = D_2 + x_1 \cdot \cos \alpha = 0$$



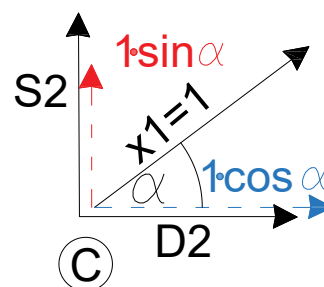
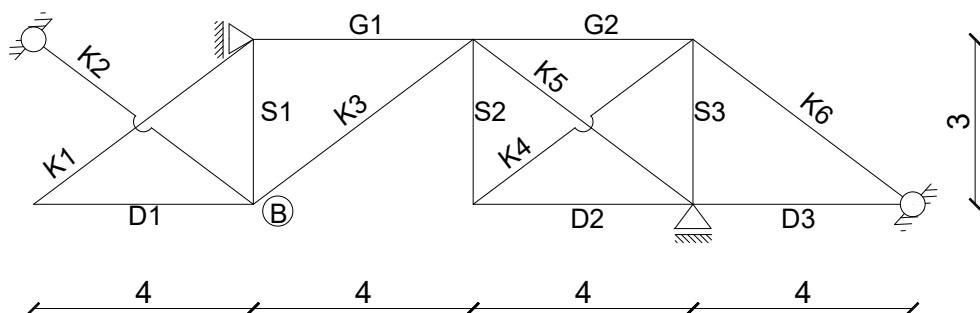
$$D_2 = -x_1 \cdot \cos \alpha = -1 \cdot \frac{4}{5} = -0,8$$

Wykresy: stan $x_1=1$, siły N1



$$\cos \alpha = \frac{4}{5} = 0,8$$

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$$\sum R_y = S_2 + x_1 \cdot \sin \alpha = 0$$



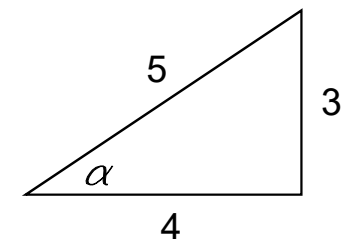
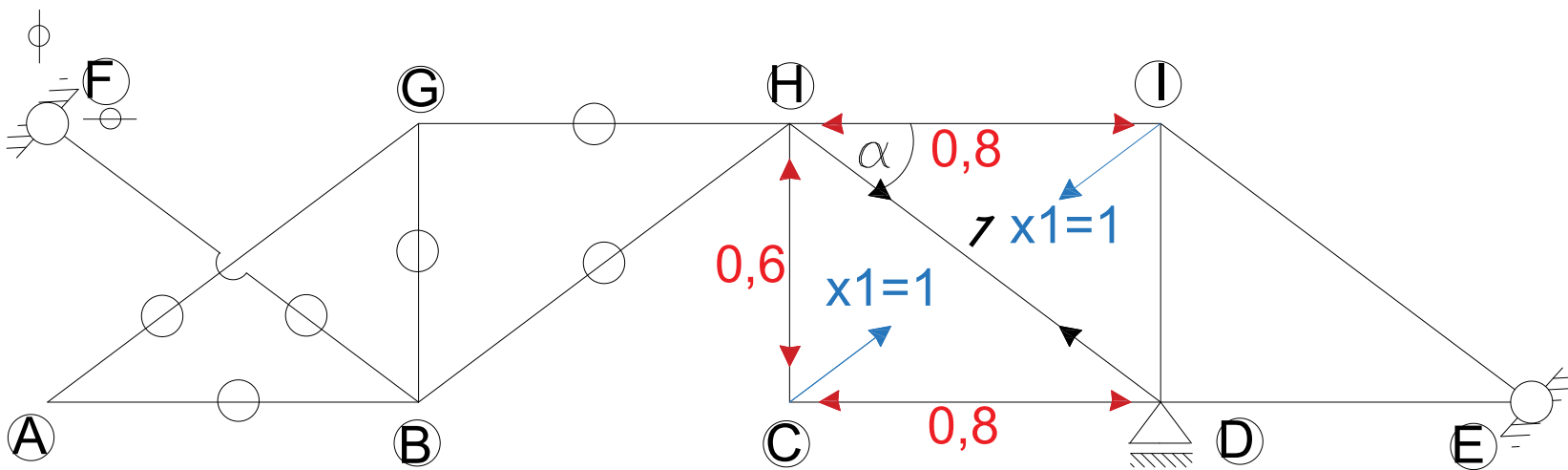
$$S_2 = -x_1 \cdot \sin \alpha = -1 \cdot \frac{3}{5} = -0,6$$

$$\sum R_x = D_2 + x_1 \cdot \cos \alpha = 0$$



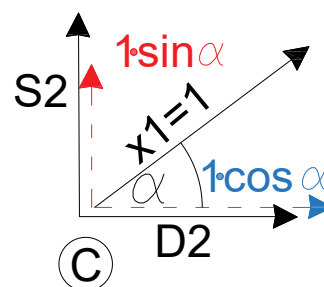
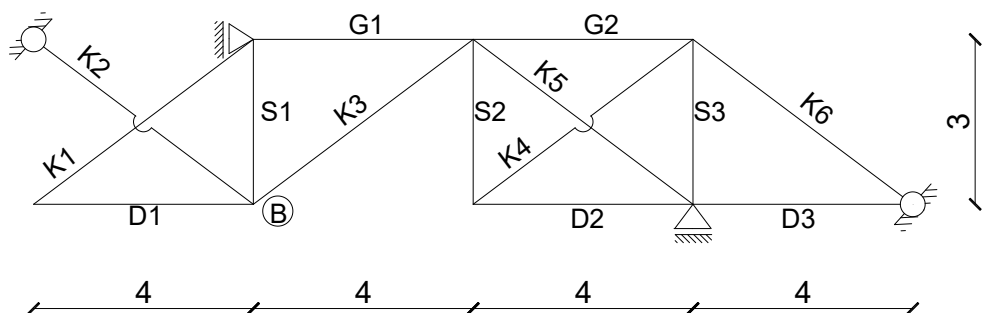
$$D_2 = -x_1 \cdot \cos \alpha = -1 \cdot \frac{4}{5} = -0,8$$

Wykresy: stan $x_1=1$, siły N1



$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$



$$\sum R_y = S2 + x1 \cdot \sin \alpha = 0$$



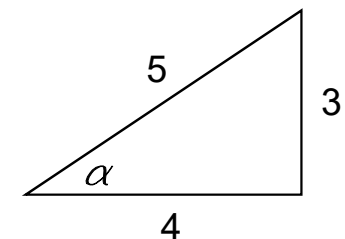
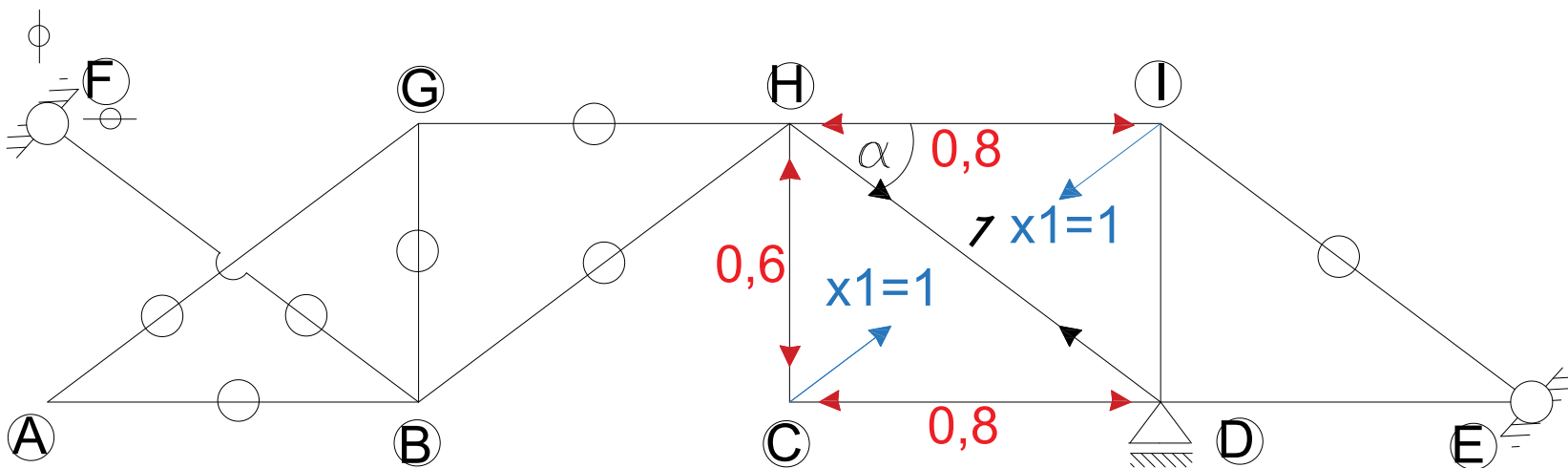
$$S2 = -x1 \cdot \sin \alpha = -1 \cdot \frac{3}{5} = -0,6$$

$$\sum R_x = D2 + x1 \cdot \cos \alpha = 0$$



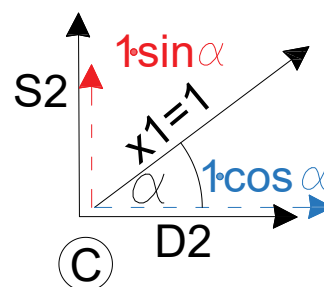
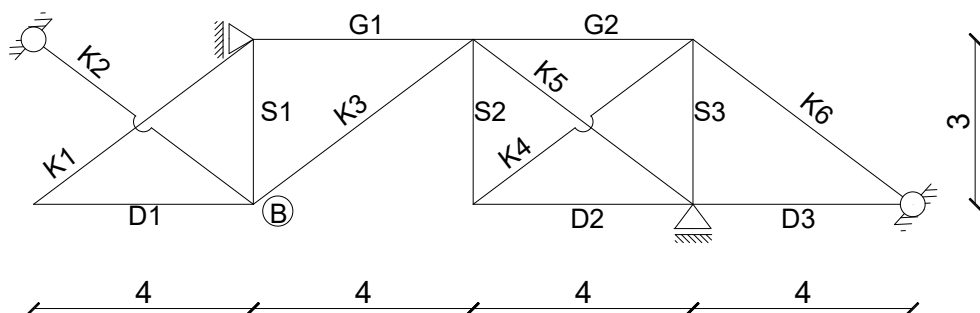
$$D2 = -x1 \cdot \cos \alpha = -1 \cdot \frac{4}{5} = -0,8$$

Wykresy: stan $x_1=1$, siły N1



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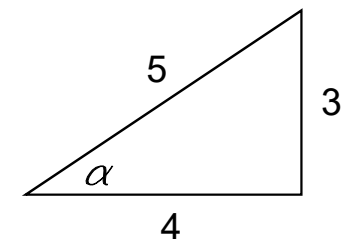
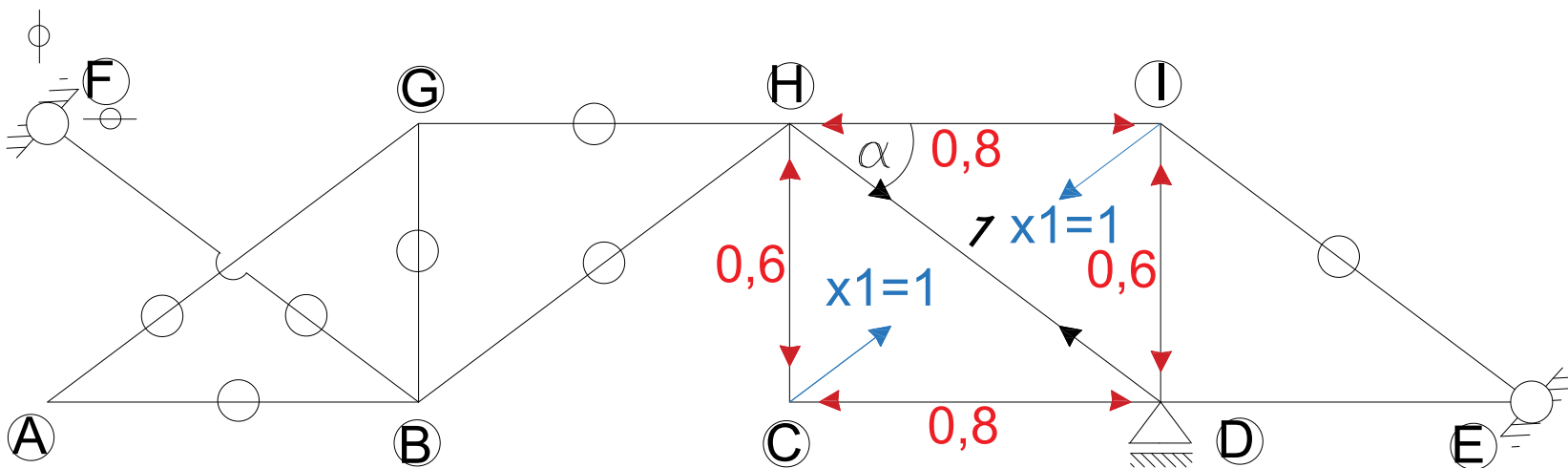
$$S_2 = -x_1 \cdot \sin \alpha = -1 \cdot \frac{3}{5} = -0,6$$

$$\sum R_x = D_2 + x_1 \cdot \cos \alpha = 0$$



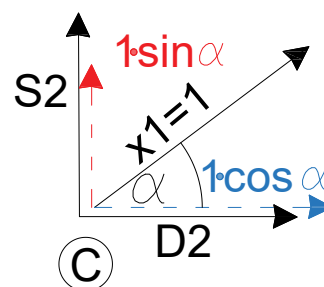
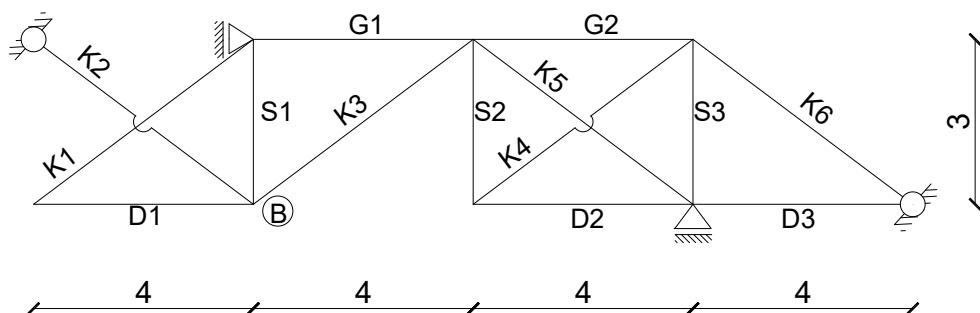
$$D_2 = -x_1 \cdot \cos \alpha = -1 \cdot \frac{4}{5} = -0,8$$

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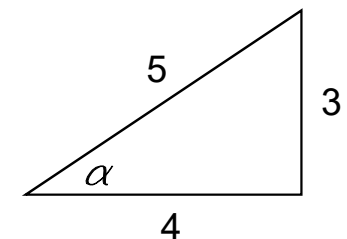
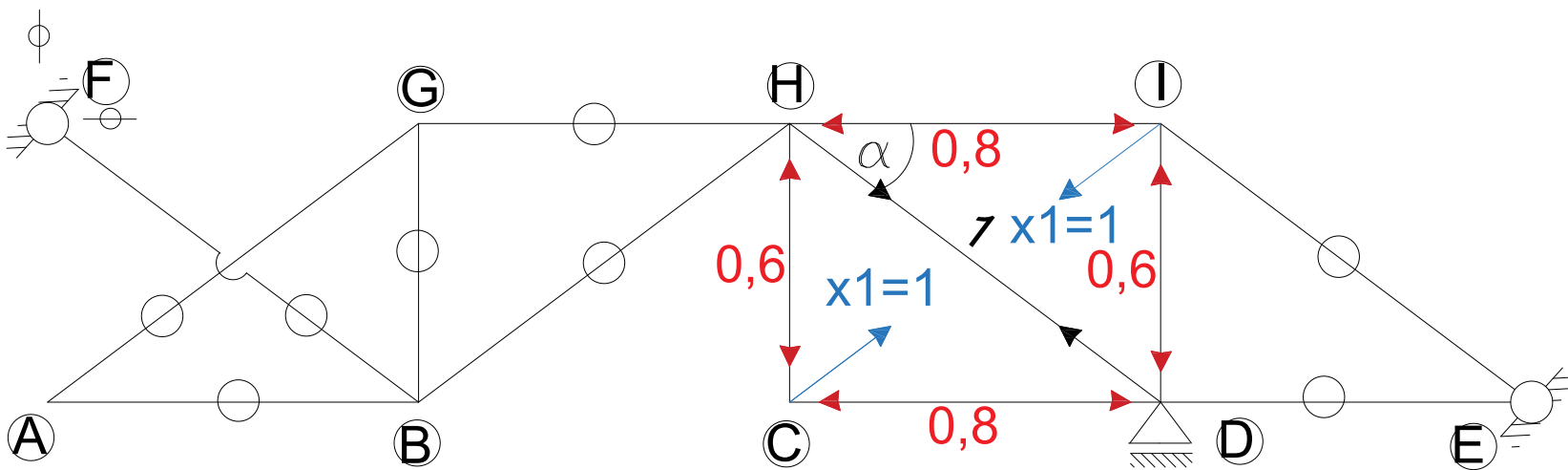
$$S2 = -x1 \cdot \sin \alpha = -1 \cdot \frac{3}{5} = -0,6$$

$$\sum R_x = D2 + x1 \cdot \cos \alpha = 0$$



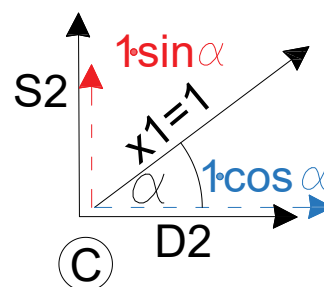
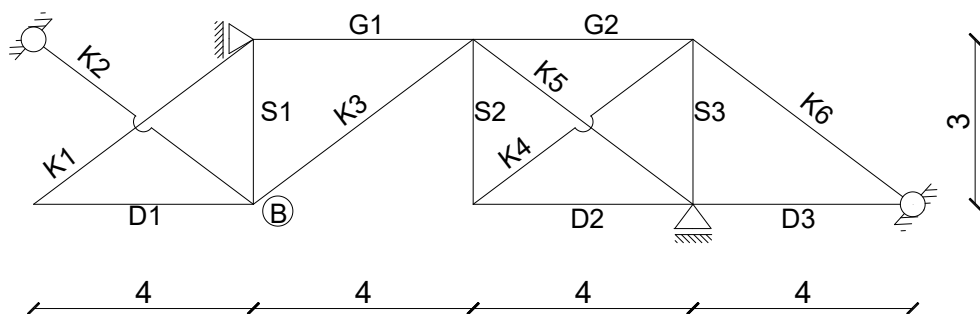
$$D2 = -x1 \cdot \cos \alpha = -1 \cdot \frac{4}{5} = -0,8$$

Wykresy: stan $x_1=1$, siły N1



$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$



$$\sum R_y = S_2 + x_1 \cdot \sin \alpha = 0$$



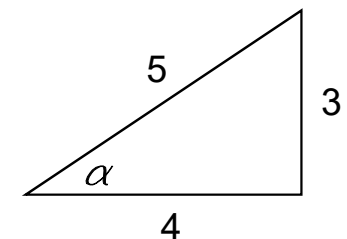
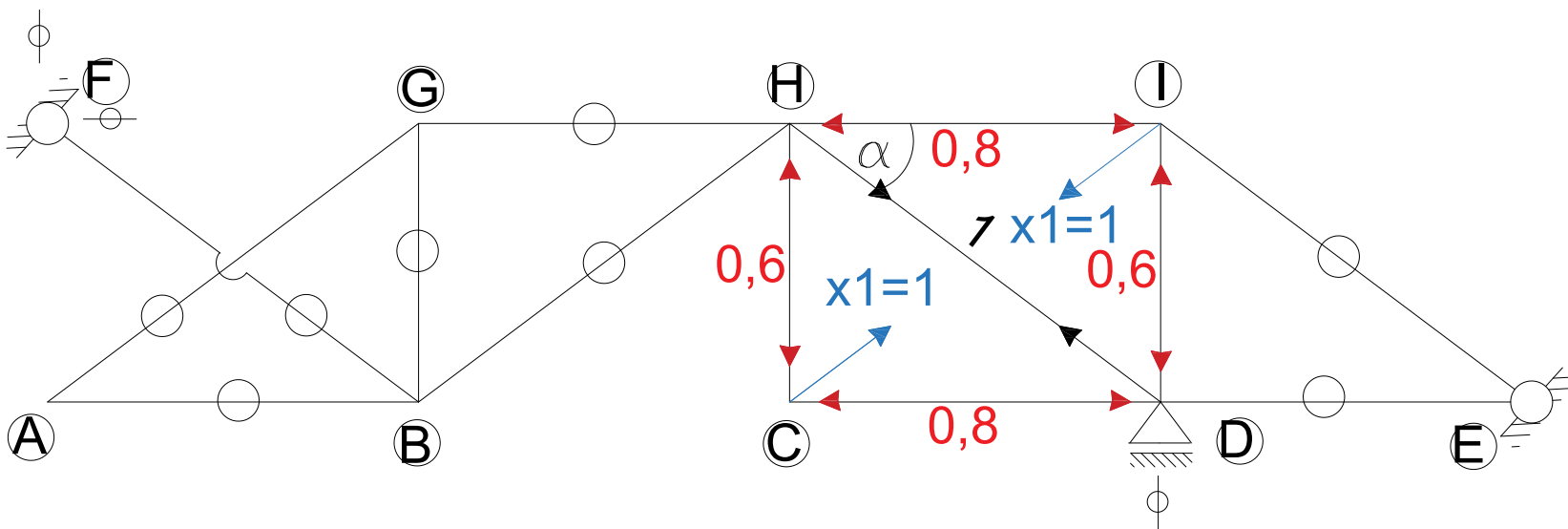
$$S_2 = -x_1 \cdot \sin \alpha = -1 \cdot \frac{3}{5} = -0,6$$

$$\sum R_x = D_2 + x_1 \cdot \cos \alpha = 0$$



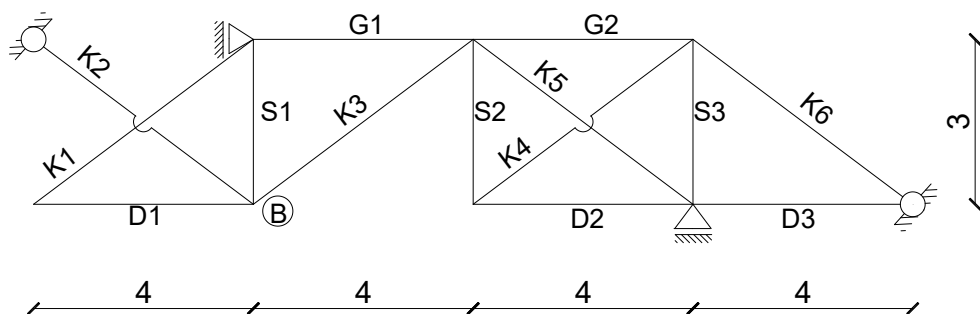
$$D_2 = -x_1 \cdot \cos \alpha = -1 \cdot \frac{4}{5} = -0,8$$

Wykresy: stan $x_1=1$, siły N1

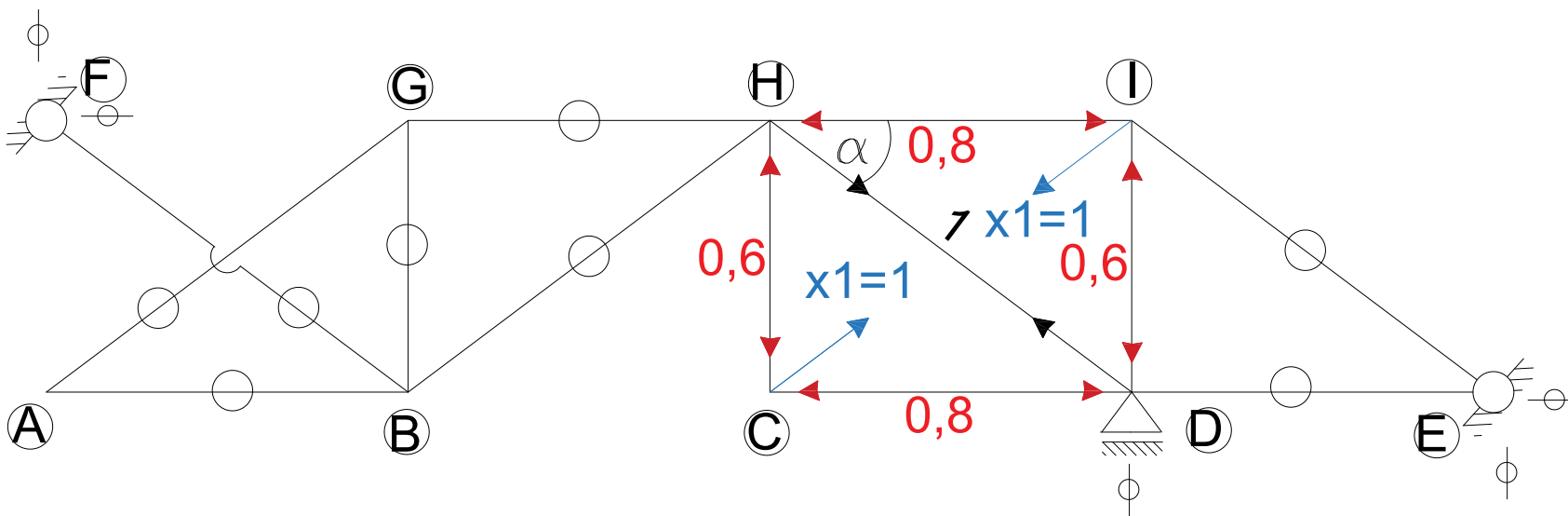


$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$

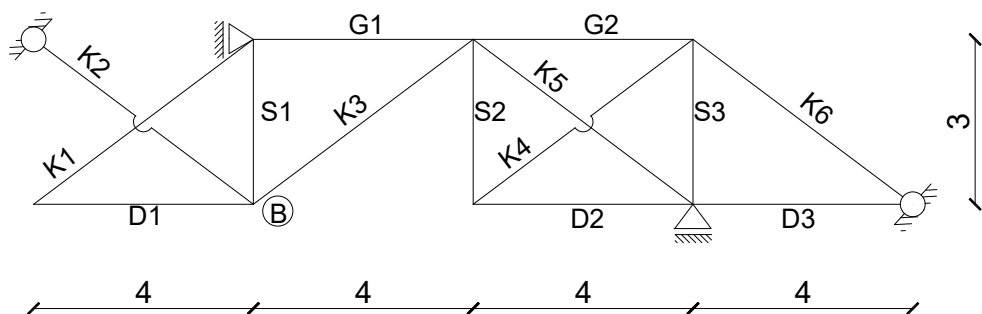


Wykresy: stan $x_1=1$, siły N1

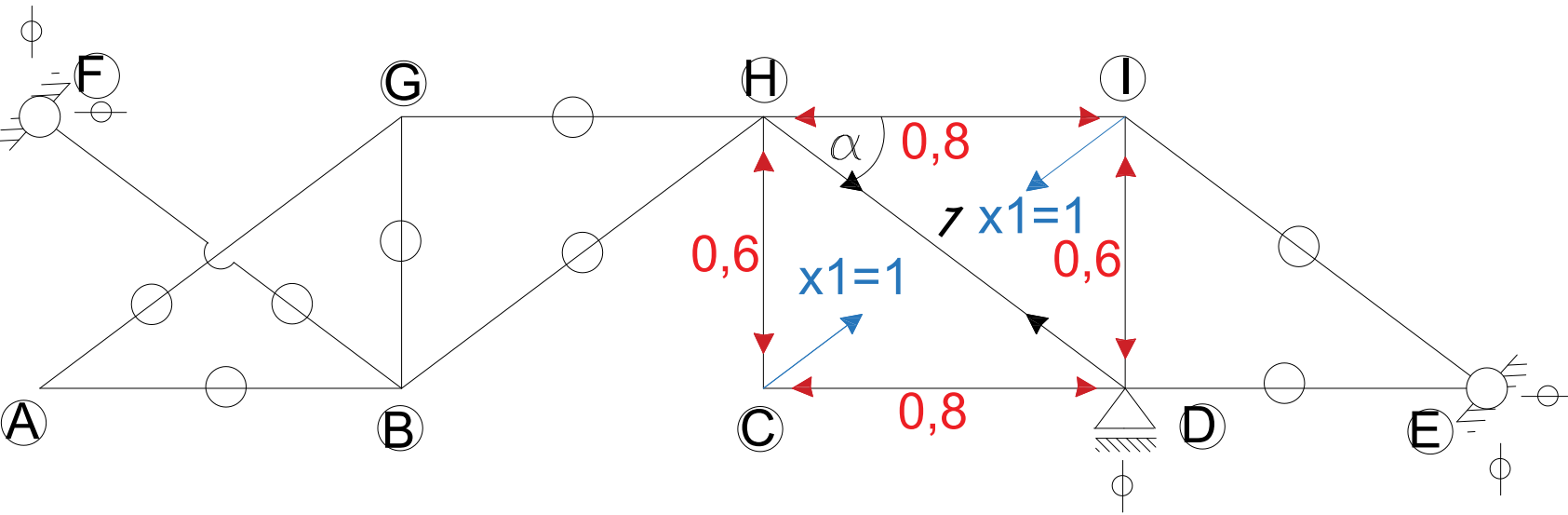


$$\cos \alpha = \frac{4}{5} = 0,8$$

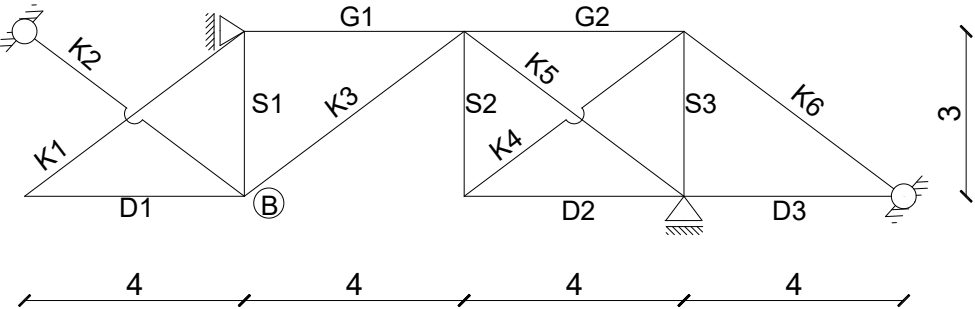
$$\sin \alpha = \frac{3}{5} = 0,6$$



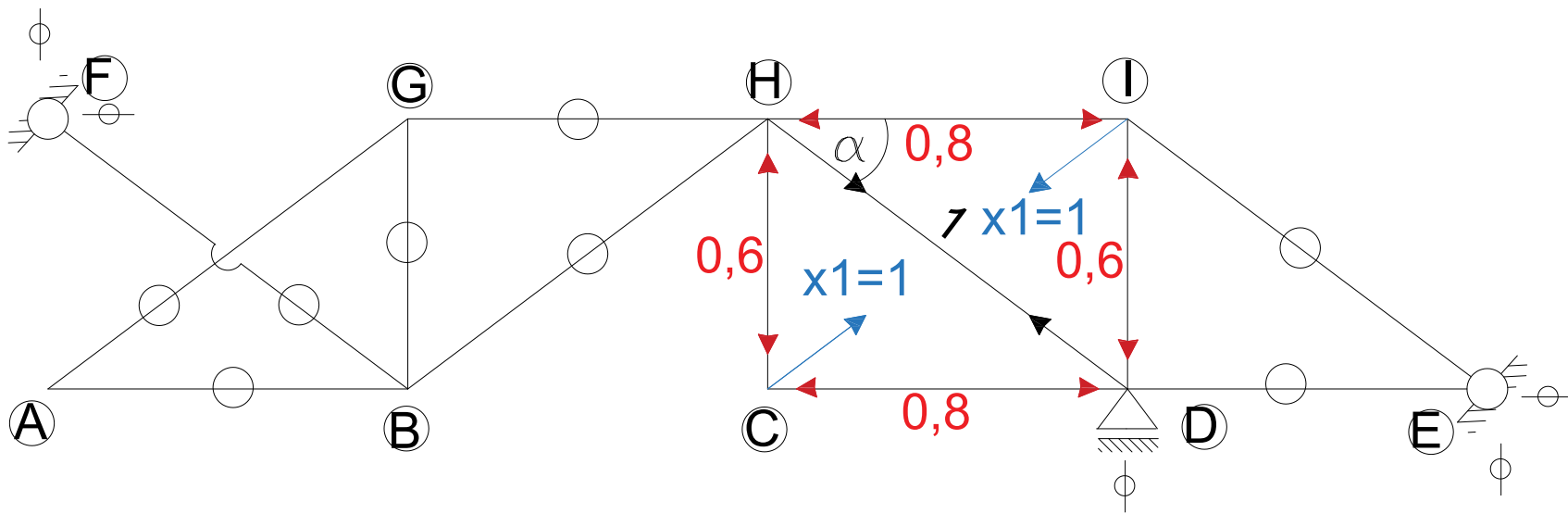
Wykresy: stan $x_1=1$, siły N1



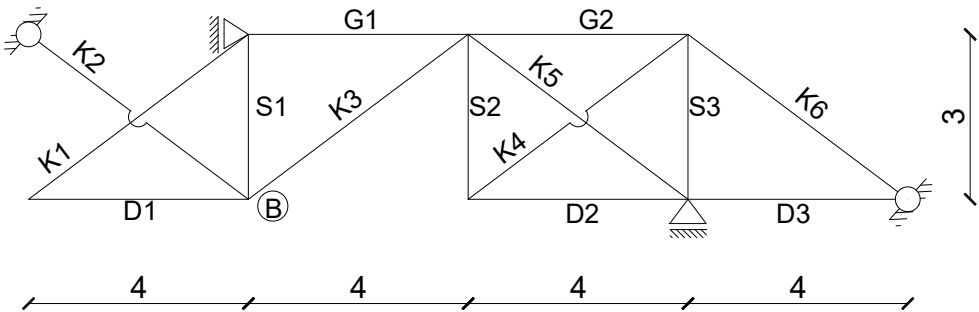
Pręt		
D1		
D2		
D3		
G1		
G2		
S1		
S2		
S3		
K1		
K2		
K3		
K4		
K5		
K6		



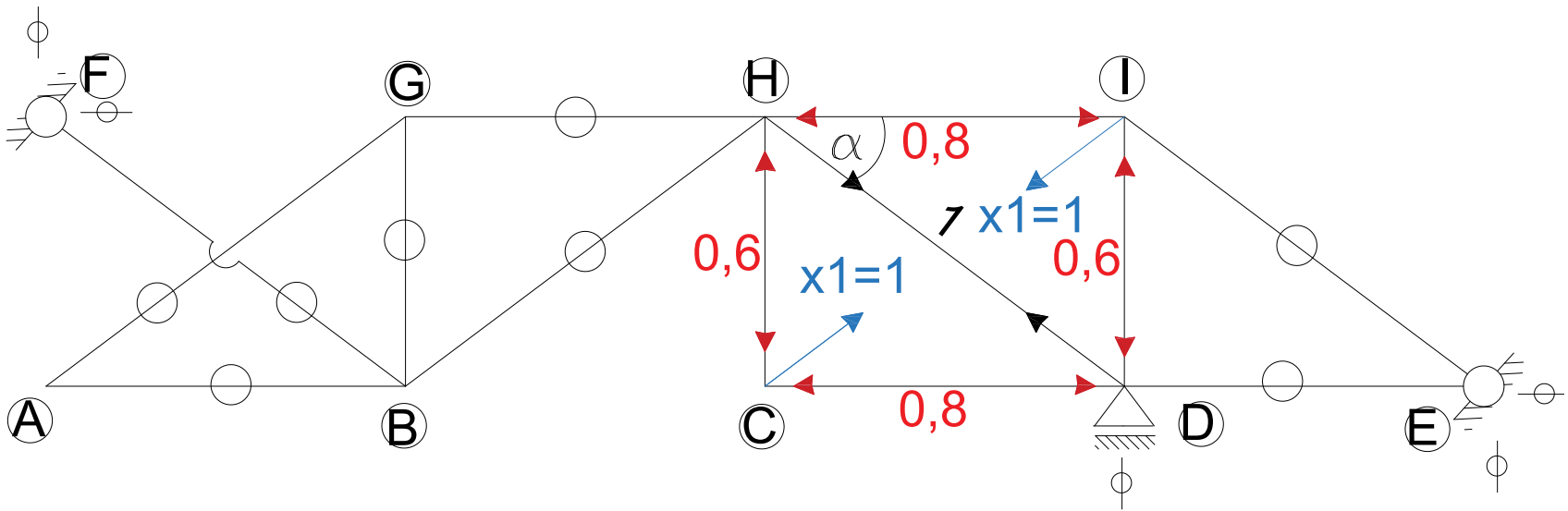
Wykresy: stan $x_1=1$, siły N1



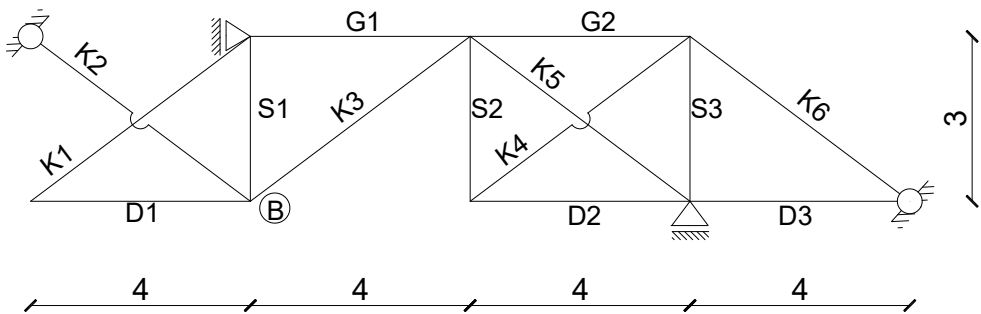
Pręt	L/EA	
D1	4	
D2	4	
D3	4	
G1	4	
G2	4	
S1	3	
S2	3	
S3	3	
K1	2,5	
K2	2,5	
K3	2,5	
K4	2,5	
K5	2,5	
K6	2,5	



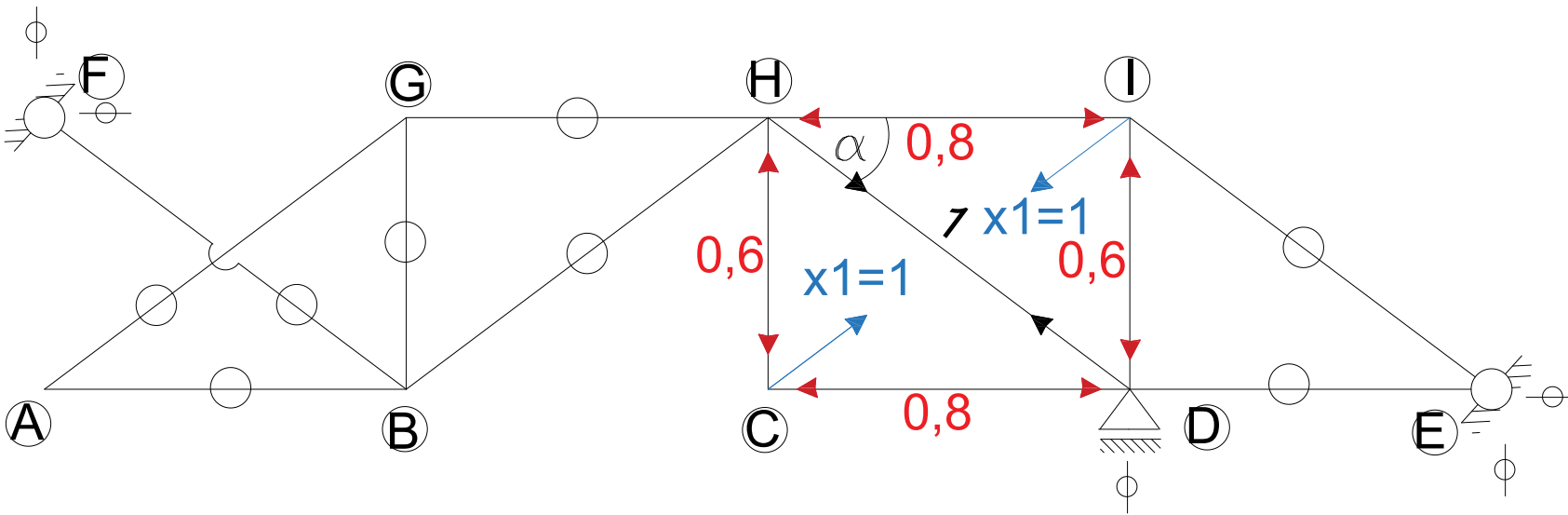
Wykresy: stan $x_1=1$, siły N1



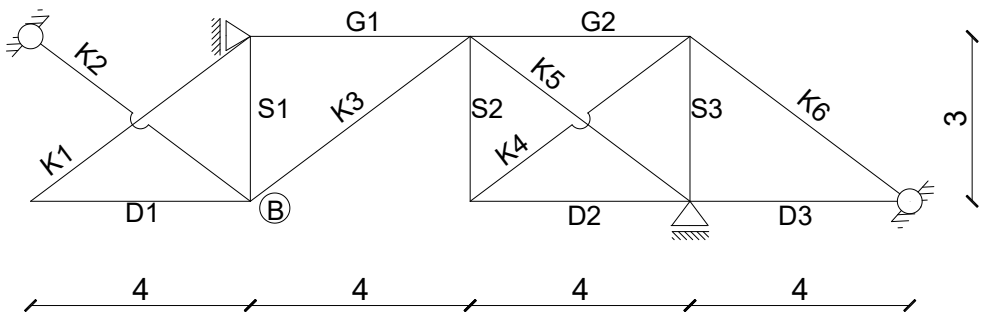
Pręt	L/EA	N1
D1	4	0
D2	4	
D3	4	
G1	4	
G2	4	
S1	3	
S2	3	
S3	3	
K1	2,5	
K2	2,5	
K3	2,5	
K4	2,5	
K5	2,5	
K6	2,5	



Wykresy: stan $x_1=1$, siły N_1

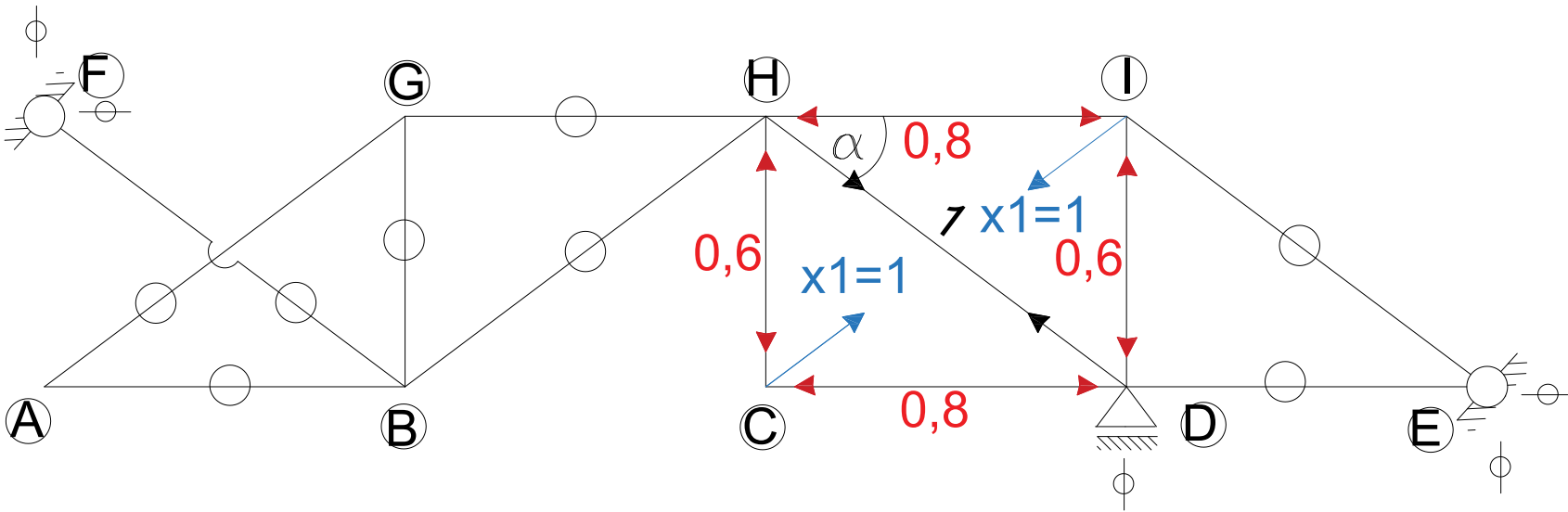


Pręt	L/EA	N1
D1	4	0
D2	4	-0,8
D3	4	
G1	4	
G2	4	
S1	3	
S2	3	
S3	3	
K1	2,5	
K2	2,5	
K3	2,5	
K4	2,5	
K5	2,5	
K6	2,5	

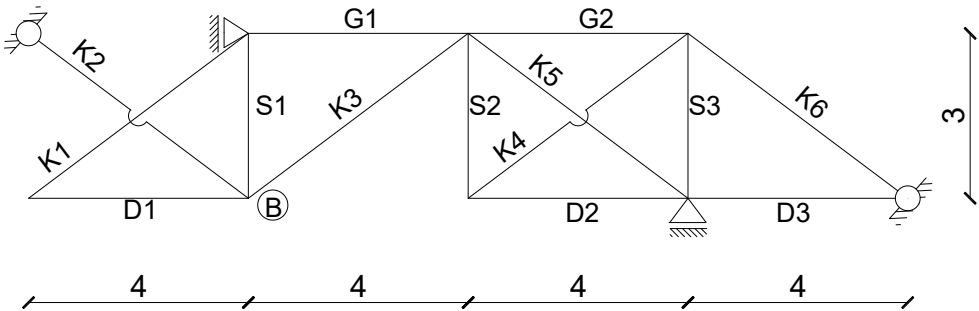


dr inż. Hanna Weber

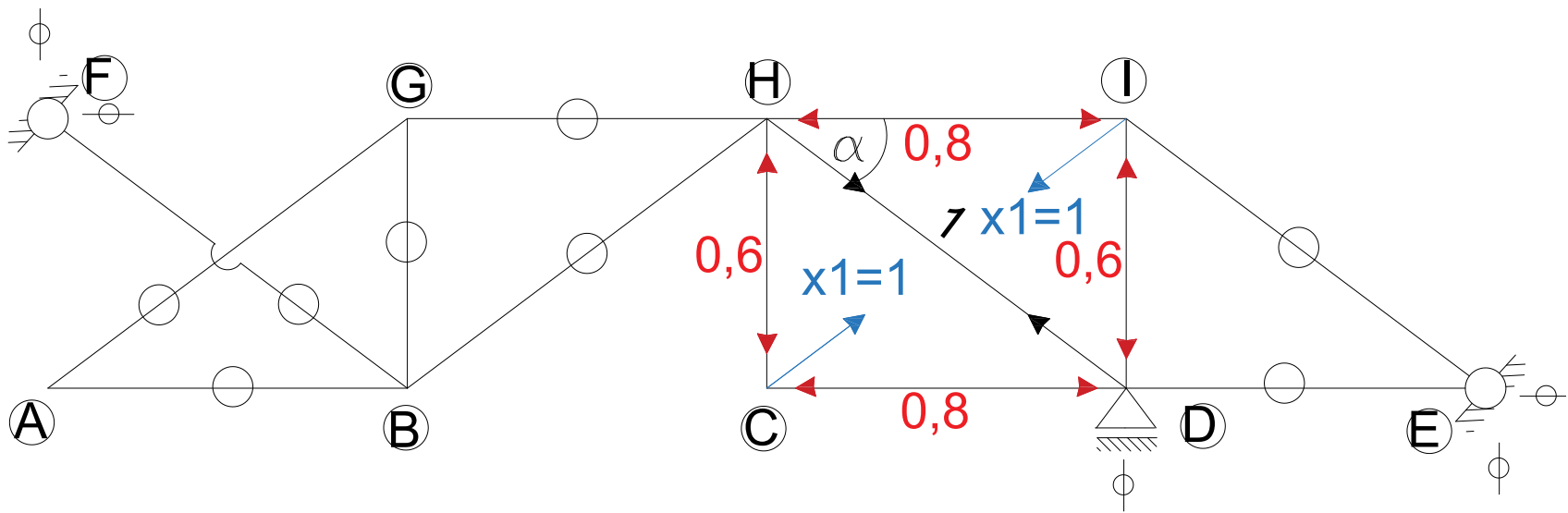
Wykresy: stan $x_1=1$, siły N1



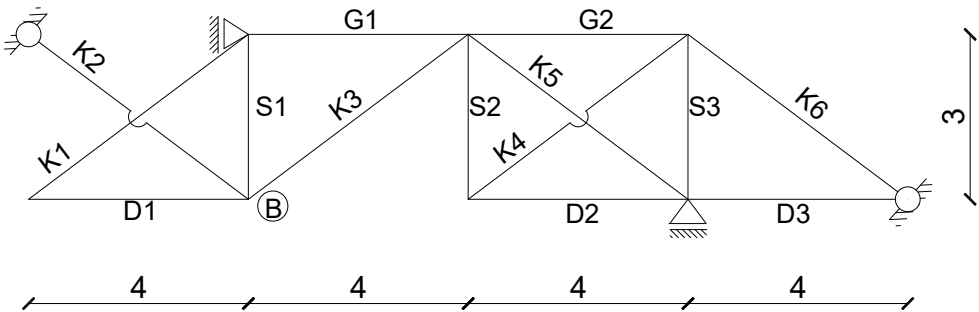
Pręt	L/EA	N1
D1	4	0
D2	4	-0,8
D3	4	0
G1	4	
G2	4	
S1	3	
S2	3	
S3	3	
K1	2,5	
K2	2,5	
K3	2,5	
K4	2,5	
K5	2,5	
K6	2,5	



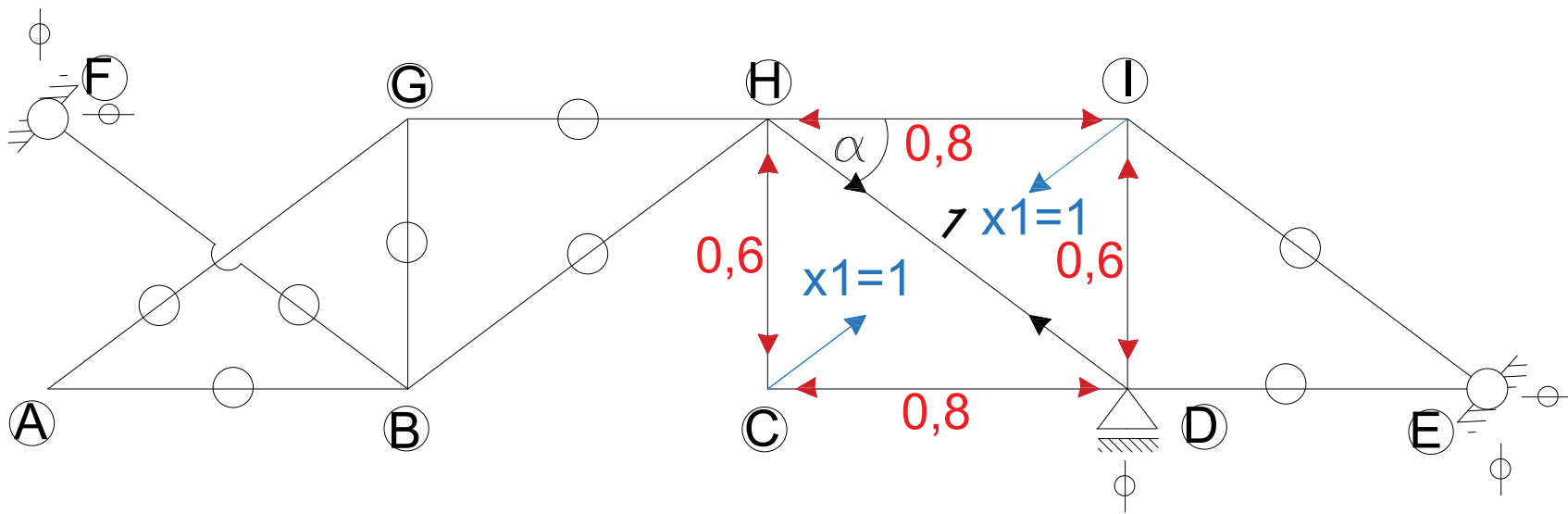
Wykresy: stan $x_1=1$, siły N1



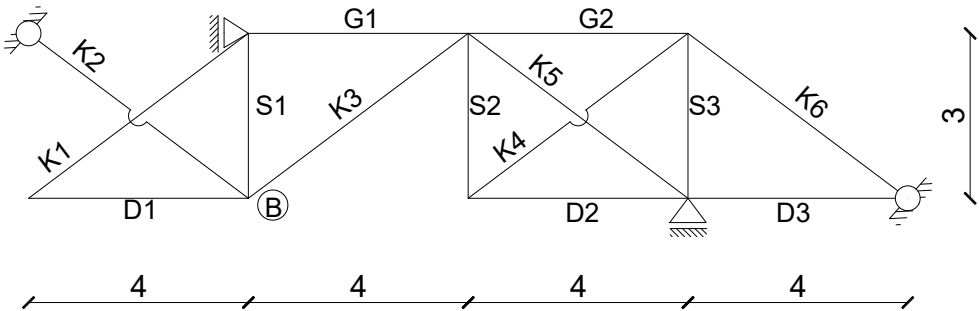
Pręt	L/EA	N1
D1	4	0
D2	4	-0,8
D3	4	0
G1	4	0
G2	4	
S1	3	
S2	3	
S3	3	
K1	2,5	
K2	2,5	
K3	2,5	
K4	2,5	
K5	2,5	
K6	2,5	



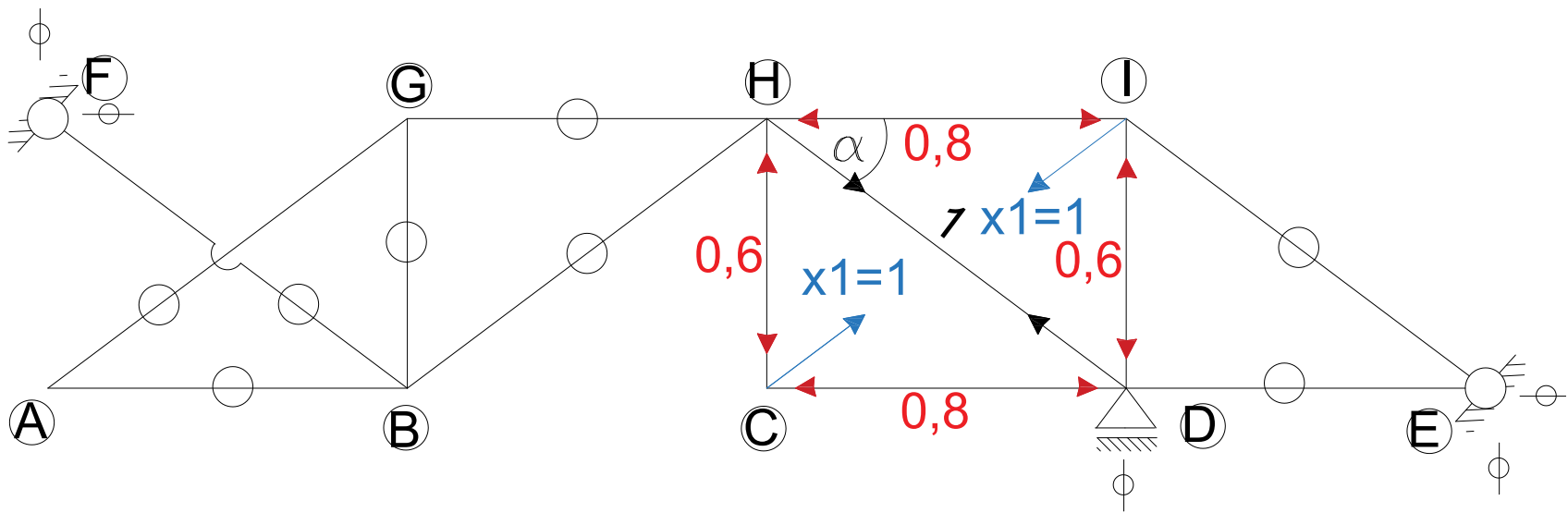
Wykresy: stan $x_1=1$, siły N1



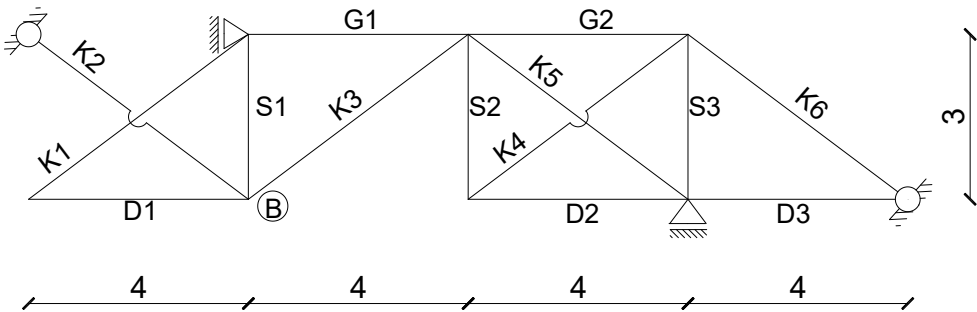
Pręt	L/EA	N1
D1	4	0
D2	4	-0,8
D3	4	0
G1	4	0
G2	4	-0,8
S1	3	
S2	3	
S3	3	
K1	2,5	
K2	2,5	
K3	2,5	
K4	2,5	
K5	2,5	
K6	2,5	



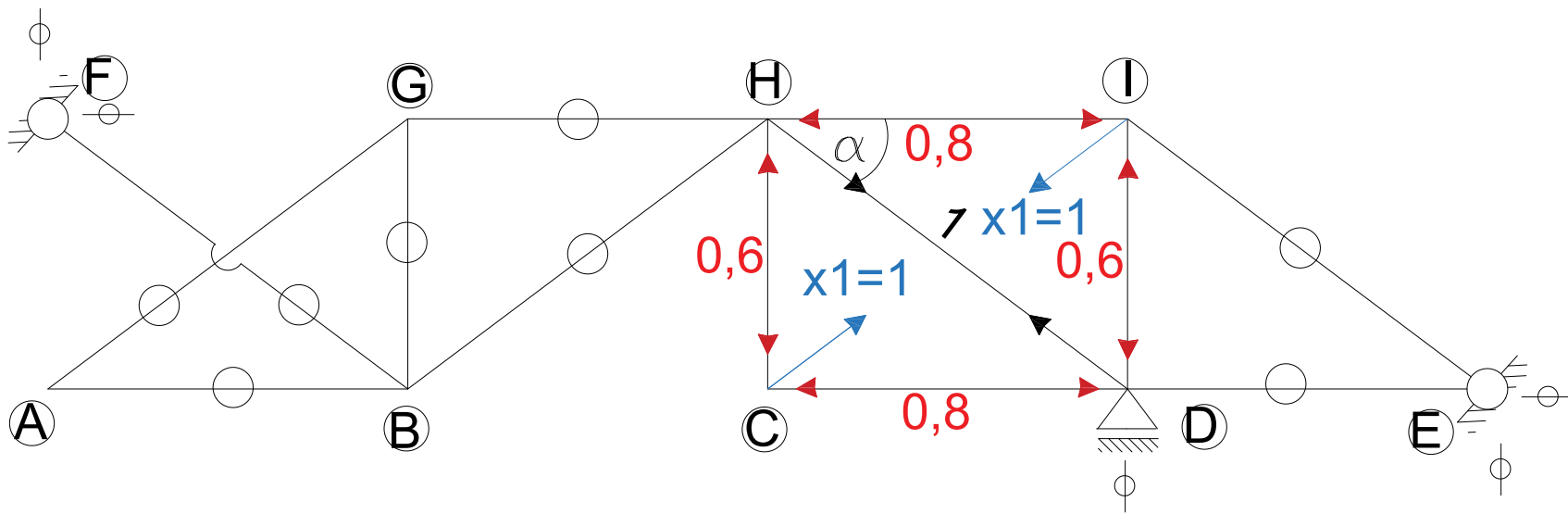
Wykresy: stan $x_1=1$, siły N1



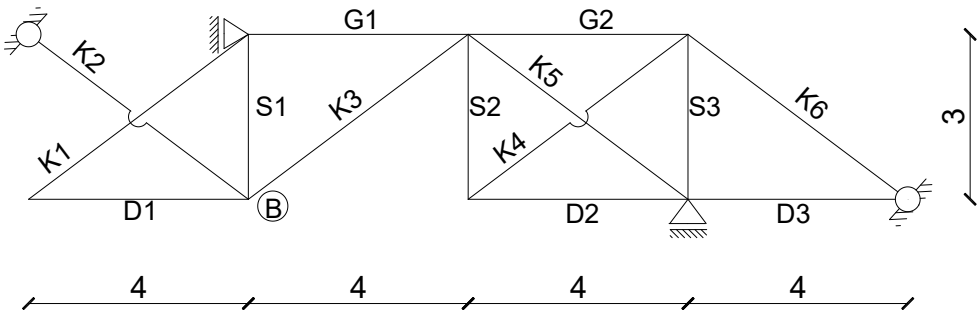
Pręt	L/EA	N1
D1	4	0
D2	4	-0,8
D3	4	0
G1	4	0
G2	4	-0,8
S1	3	0
S2	3	
S3	3	
K1	2,5	
K2	2,5	
K3	2,5	
K4	2,5	
K5	2,5	
K6	2,5	



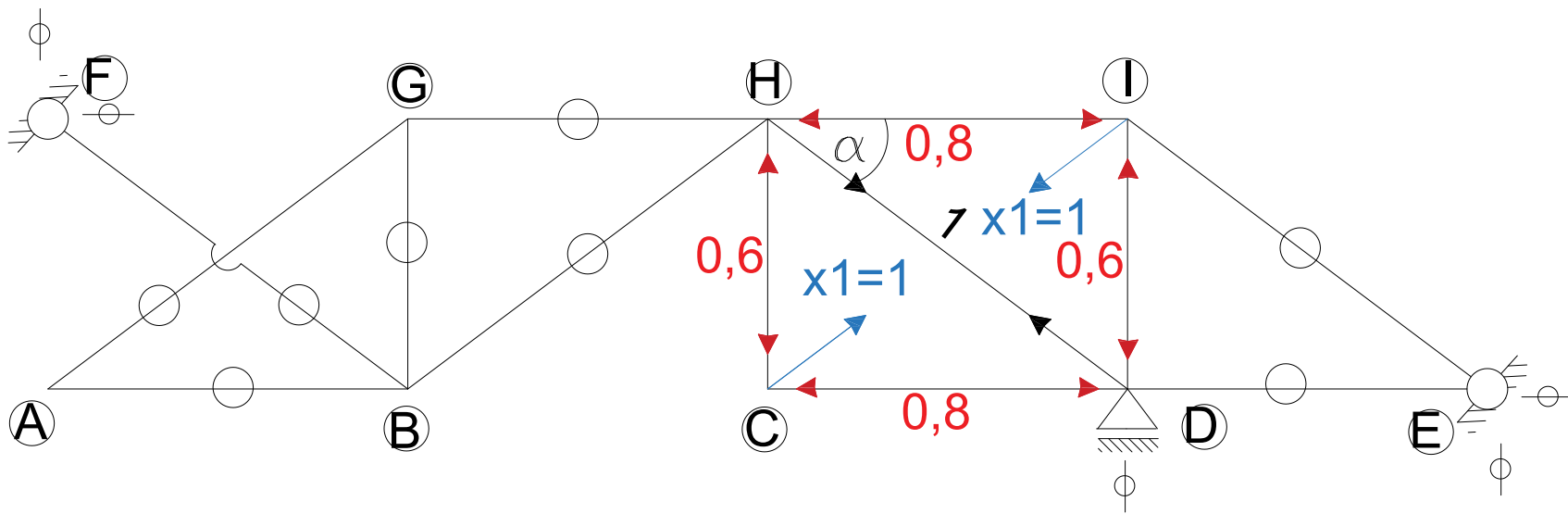
Wykresy: stan $x_1=1$, siły N1



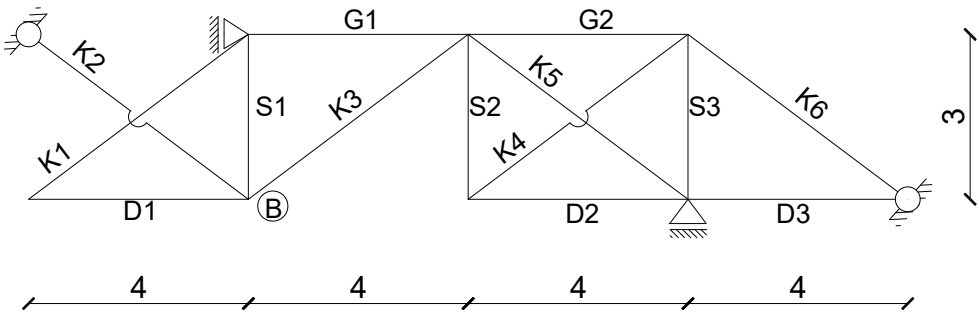
Pręt	L/EA	N1
D1	4	0
D2	4	-0,8
D3	4	0
G1	4	0
G2	4	-0,8
S1	3	0
S2	3	-0,6
S3	3	
K1	2,5	
K2	2,5	
K3	2,5	
K4	2,5	
K5	2,5	
K6	2,5	



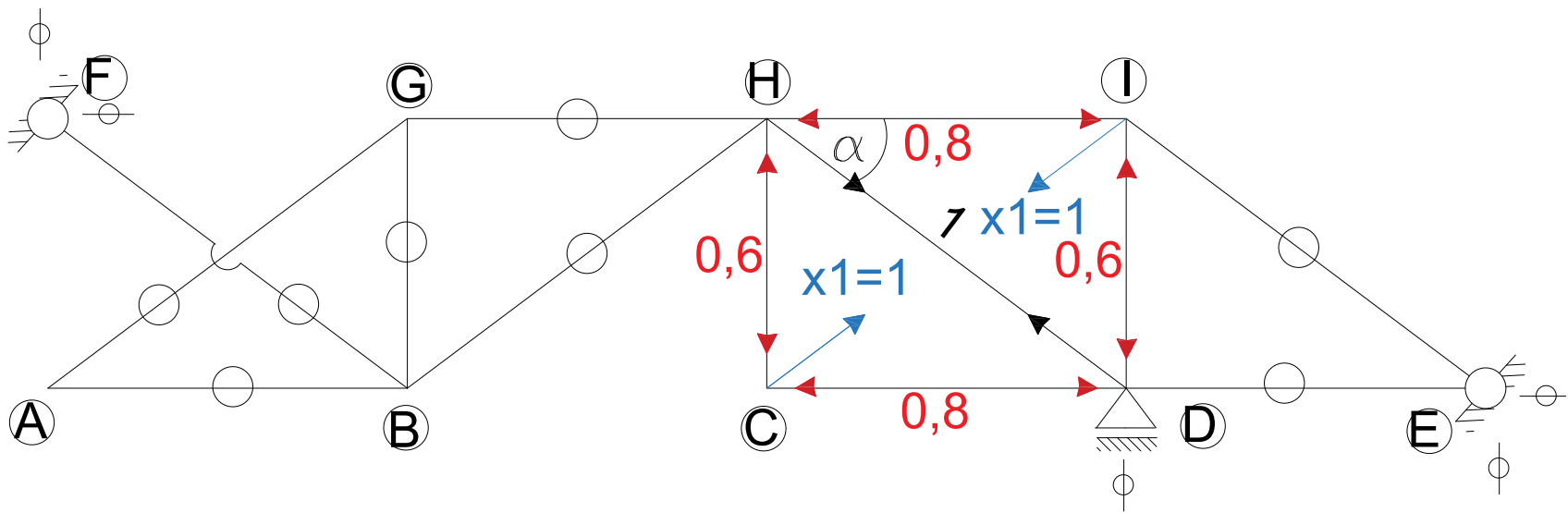
Wykresy: stan $x_1=1$, siły N1



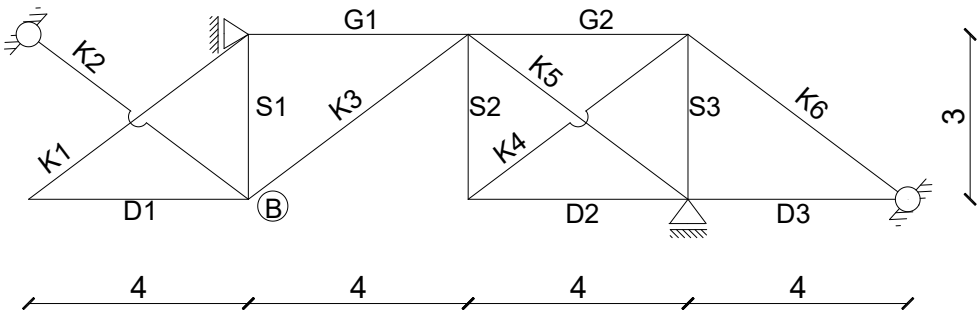
Pręt	L/EA	N1
D1	4	0
D2	4	-0,8
D3	4	0
G1	4	0
G2	4	-0,8
S1	3	0
S2	3	-0,6
S3	3	-0,6
K1	2,5	
K2	2,5	
K3	2,5	
K4	2,5	
K5	2,5	
K6	2,5	



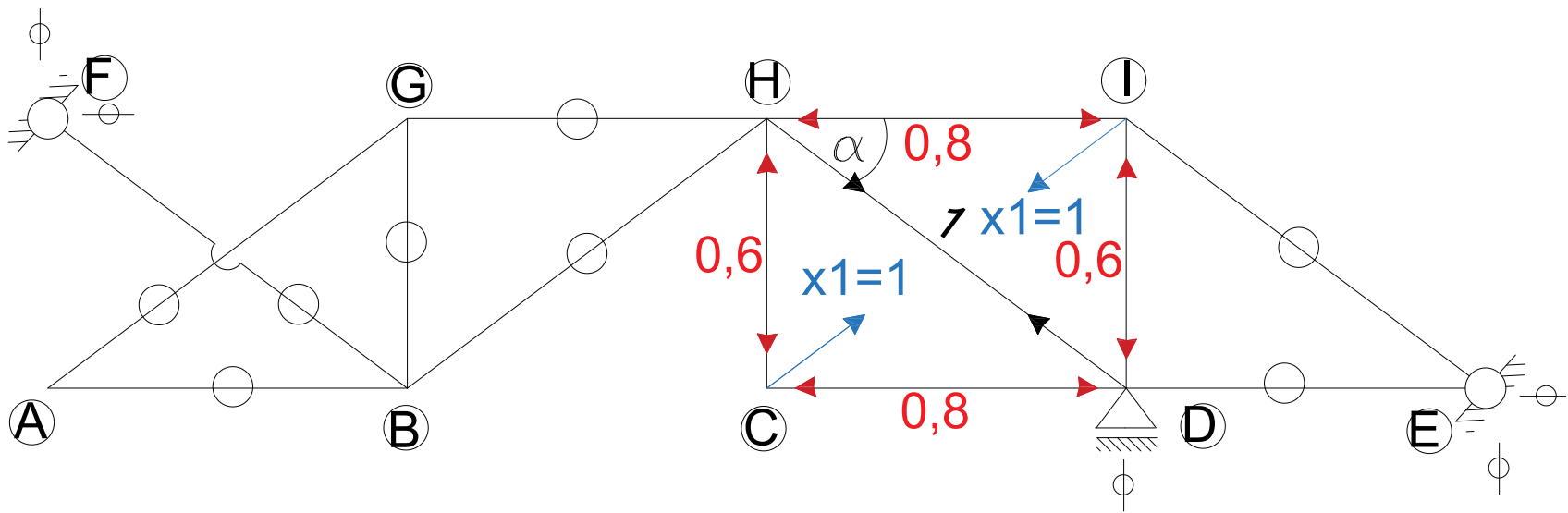
Wykresy: stan $x_1=1$, siły N1



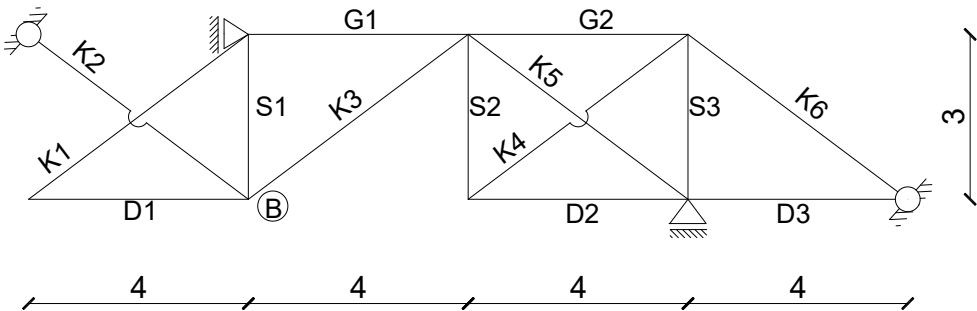
Pręt	L/EA	N1
D1	4	0
D2	4	-0,8
D3	4	0
G1	4	0
G2	4	-0,8
S1	3	0
S2	3	-0,6
S3	3	-0,6
K1	2,5	0
K2	2,5	
K3	2,5	
K4	2,5	
K5	2,5	
K6	2,5	



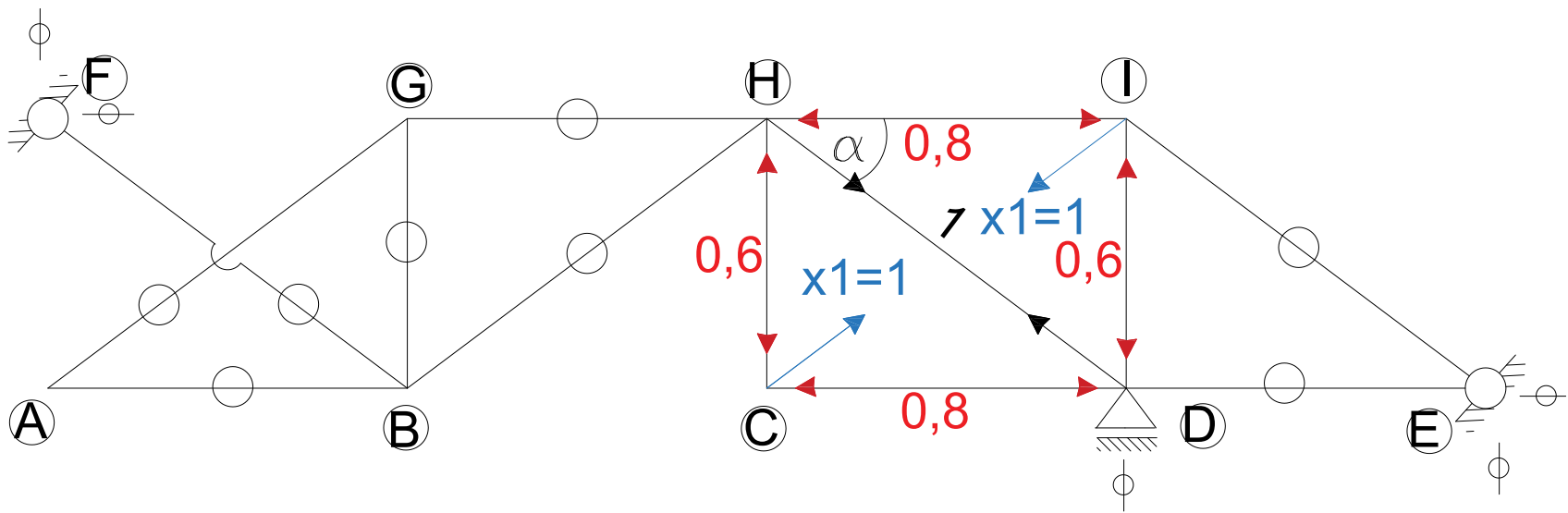
Wykresy: stan $x_1=1$, siły N1



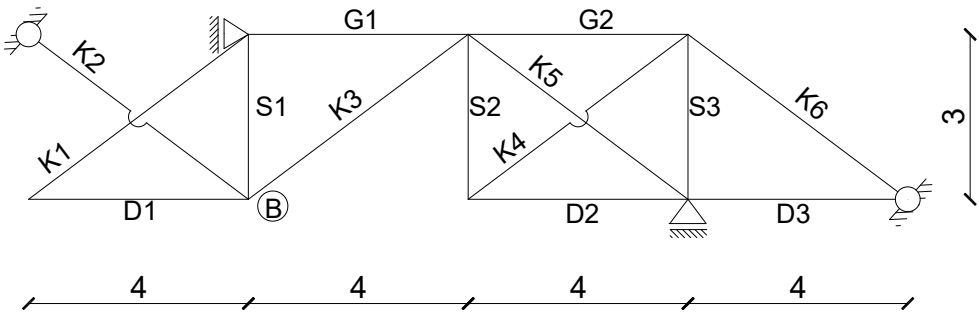
Pręt	L/EA	N1
D1	4	0
D2	4	-0,8
D3	4	0
G1	4	0
G2	4	-0,8
S1	3	0
S2	3	-0,6
S3	3	-0,6
K1	2,5	0
K2	2,5	0
K3	2,5	
K4	2,5	
K5	2,5	
K6	2,5	



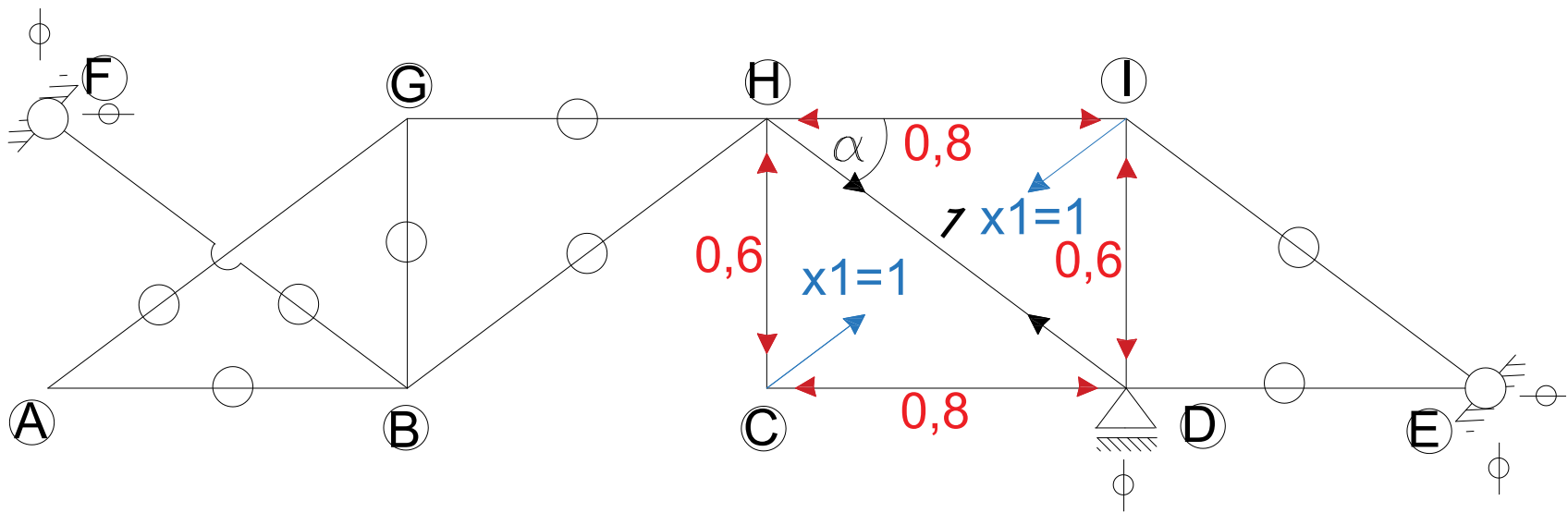
Wykresy: stan $x_1=1$, siły N1



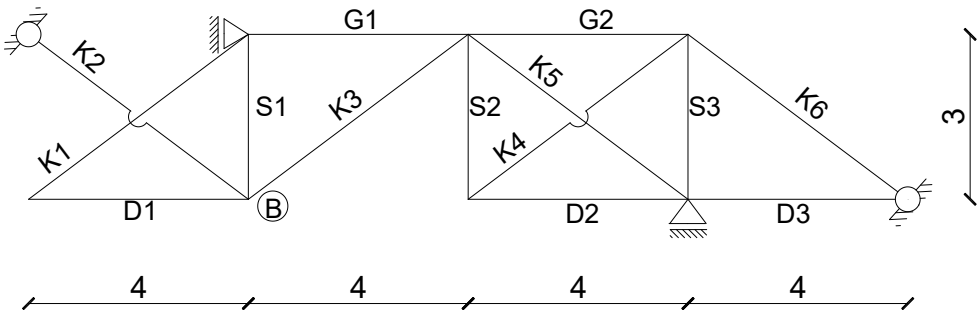
Pręt	L/EA	N1
D1	4	0
D2	4	-0,8
D3	4	0
G1	4	0
G2	4	-0,8
S1	3	0
S2	3	-0,6
S3	3	-0,6
K1	2,5	0
K2	2,5	0
K3	2,5	0
K4	2,5	
K5	2,5	
K6	2,5	



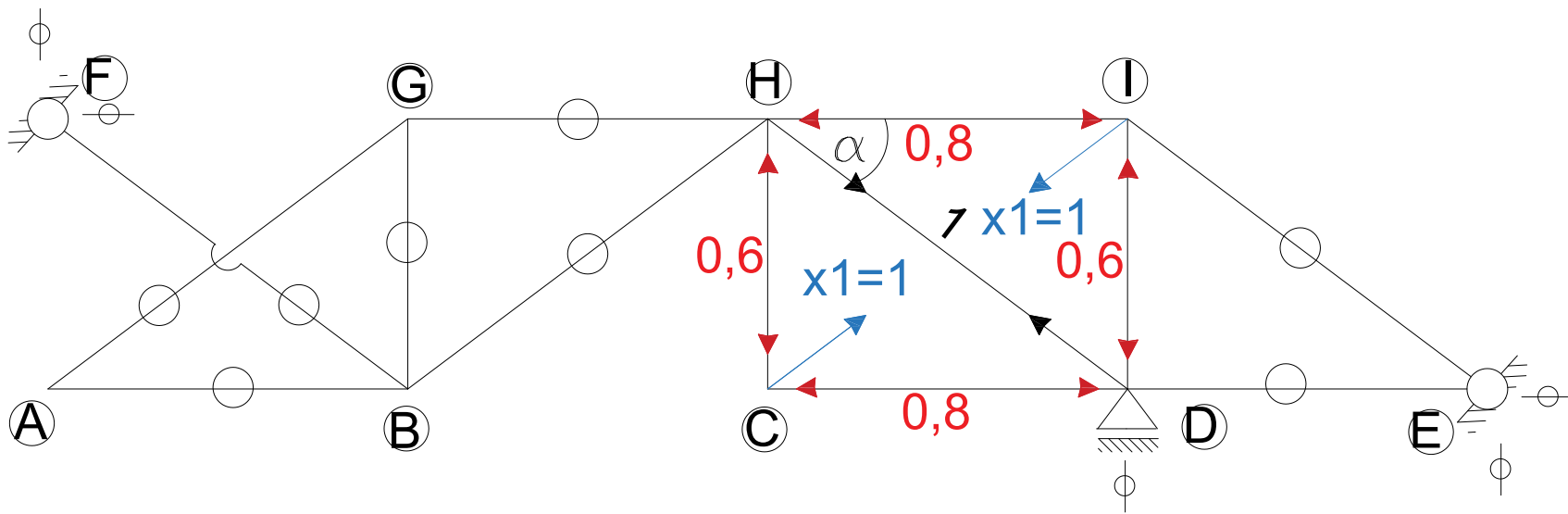
Wykresy: stan $x_1=1$, siły N1



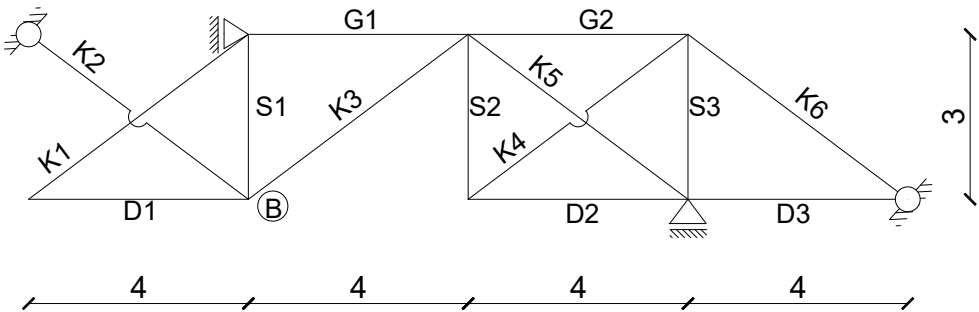
Pręt	L/EA	N1
D1	4	0
D2	4	-0,8
D3	4	0
G1	4	0
G2	4	-0,8
S1	3	0
S2	3	-0,6
S3	3	-0,6
K1	2,5	0
K2	2,5	0
K3	2,5	0
K4	2,5	1
K5	2,5	
K6	2,5	



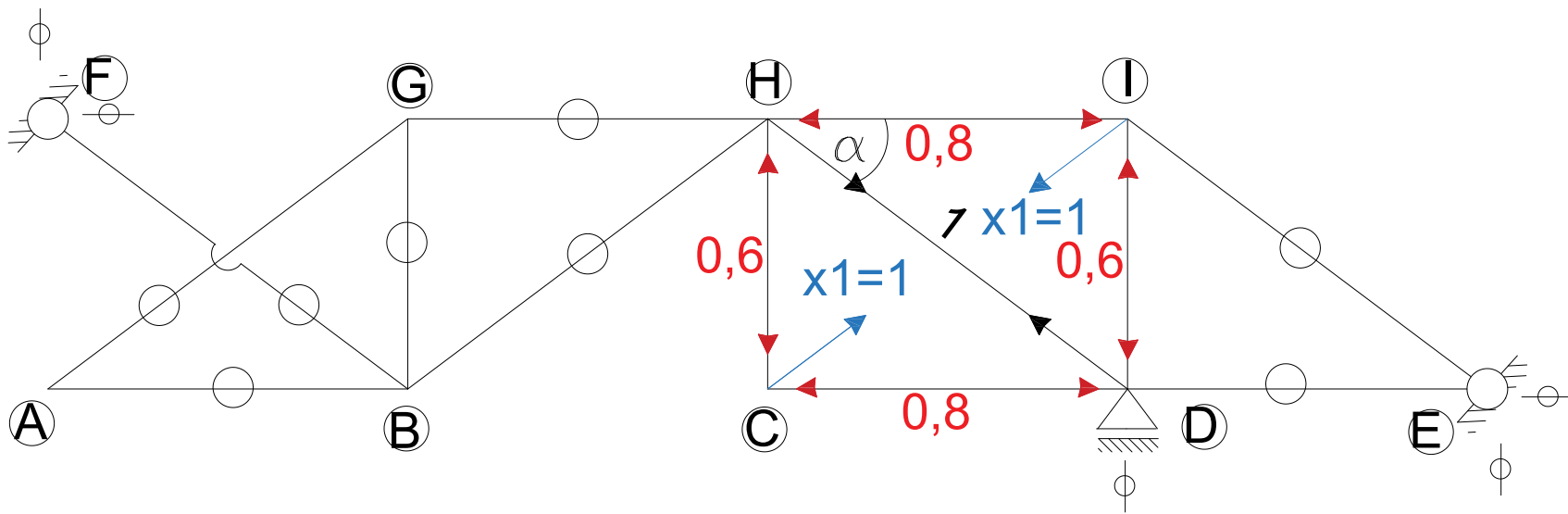
Wykresy: stan $x_1=1$, siły N1



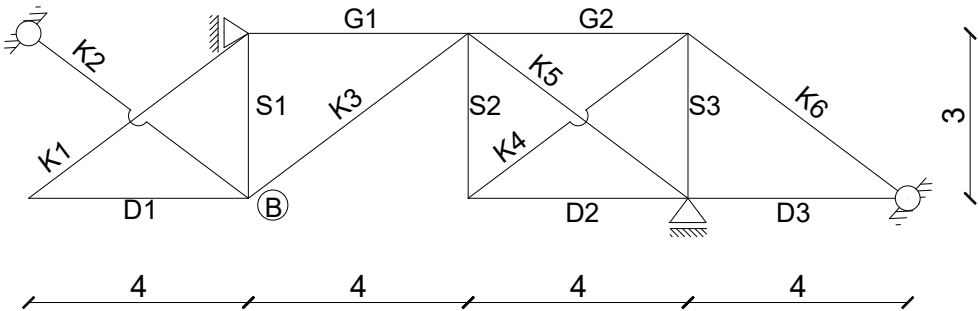
Pręt	L/EA	N1
D1	4	0
D2	4	-0,8
D3	4	0
G1	4	0
G2	4	-0,8
S1	3	0
S2	3	-0,6
S3	3	-0,6
K1	2,5	0
K2	2,5	0
K3	2,5	0
K4	2,5	1
K5	2,5	1
K6	2,5	



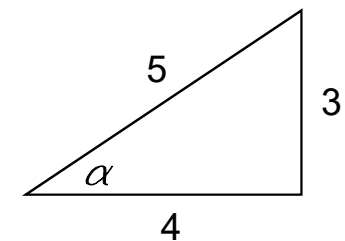
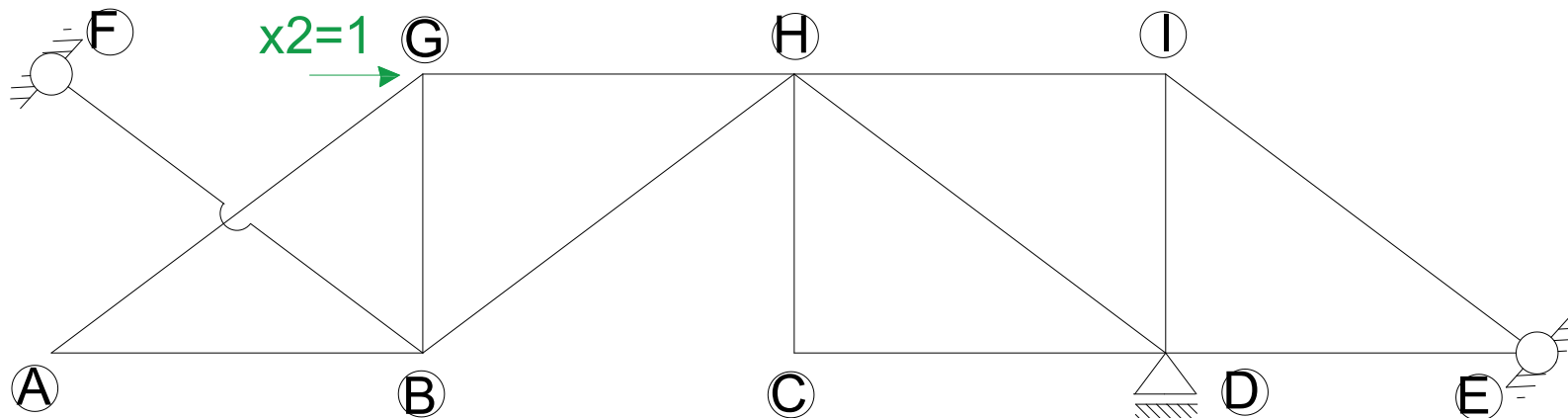
Wykresy: stan $x_1=1$, siły N1



Pręt	L/EA	N1
D1	4	0
D2	4	-0,8
D3	4	0
G1	4	0
G2	4	-0,8
S1	3	0
S2	3	-0,6
S3	3	-0,6
K1	2,5	0
K2	2,5	0
K3	2,5	0
K4	2,5	1
K5	2,5	1
K6	2,5	0

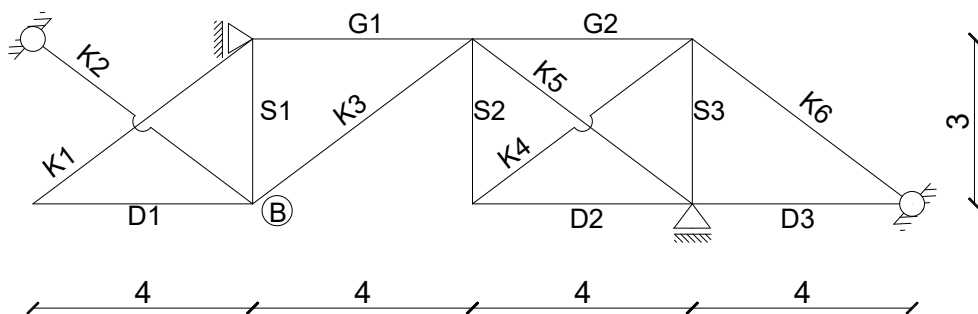


Wykresy: stan $x_2=1$ – siły N2

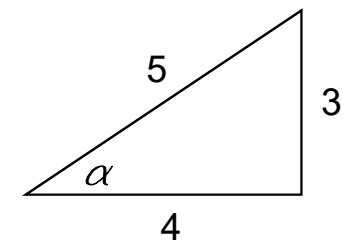
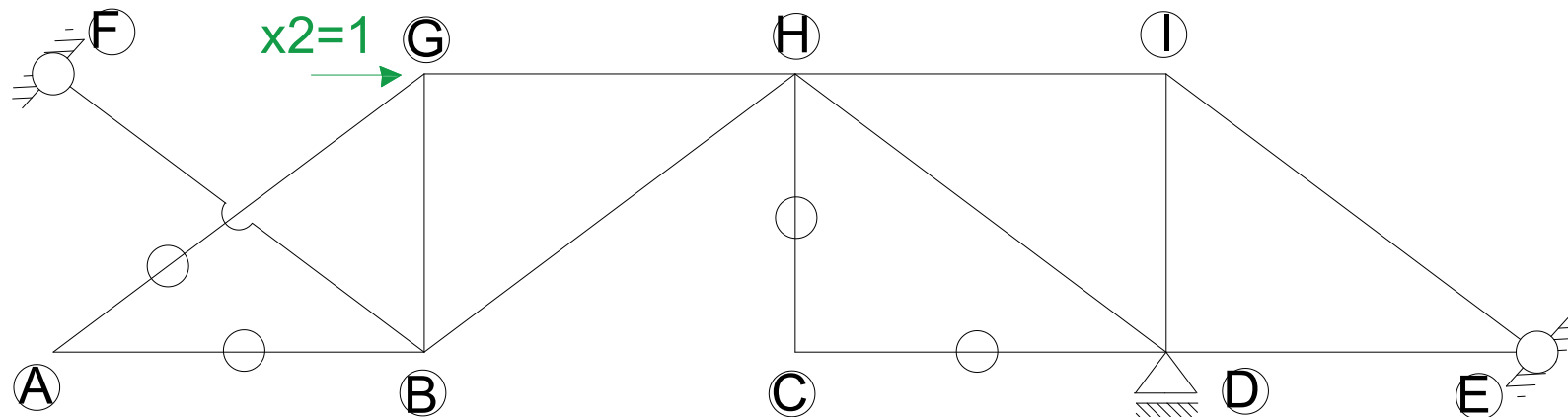


$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$

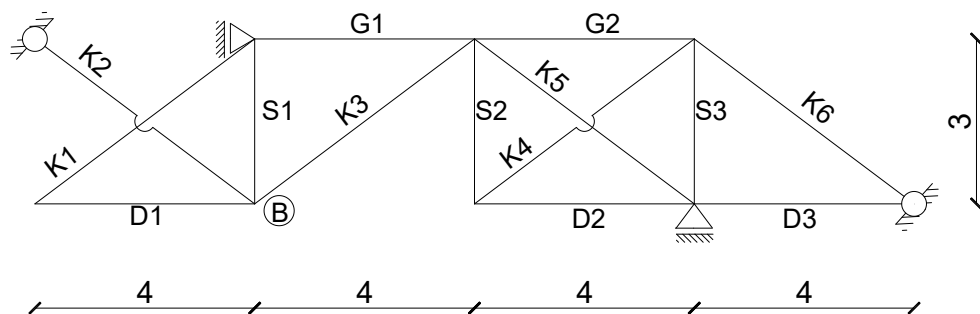


Wykresy: stan $x_2=1$ – siły N2

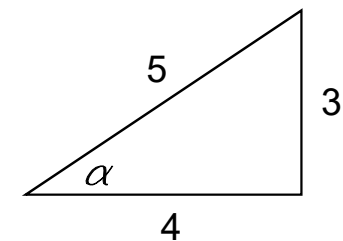
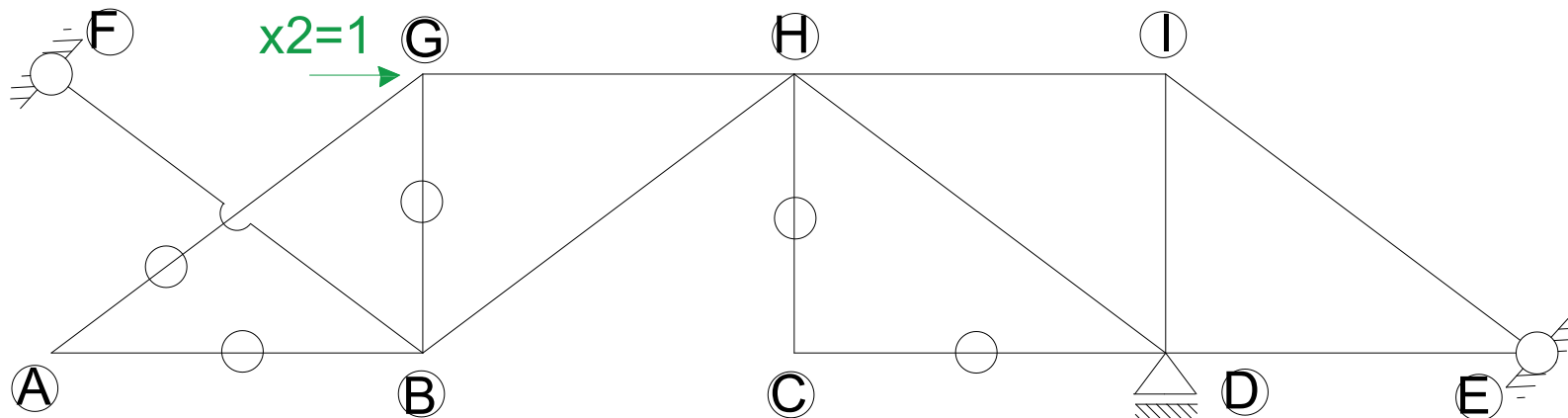


$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$

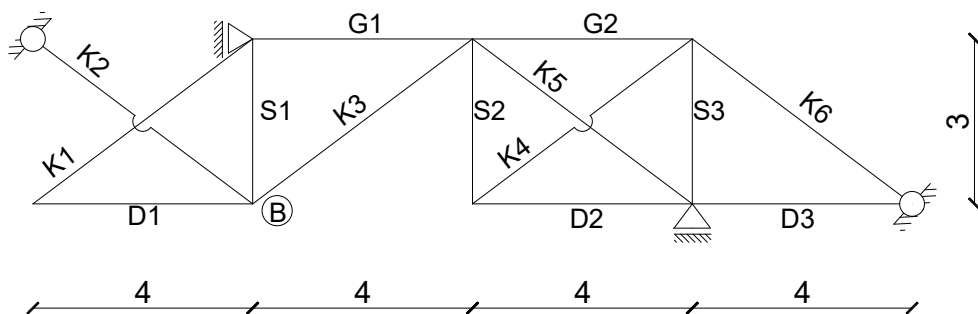


Wykresy: stan $x_2=1$ – siły N2

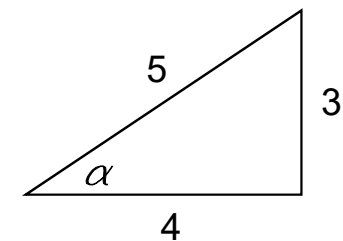
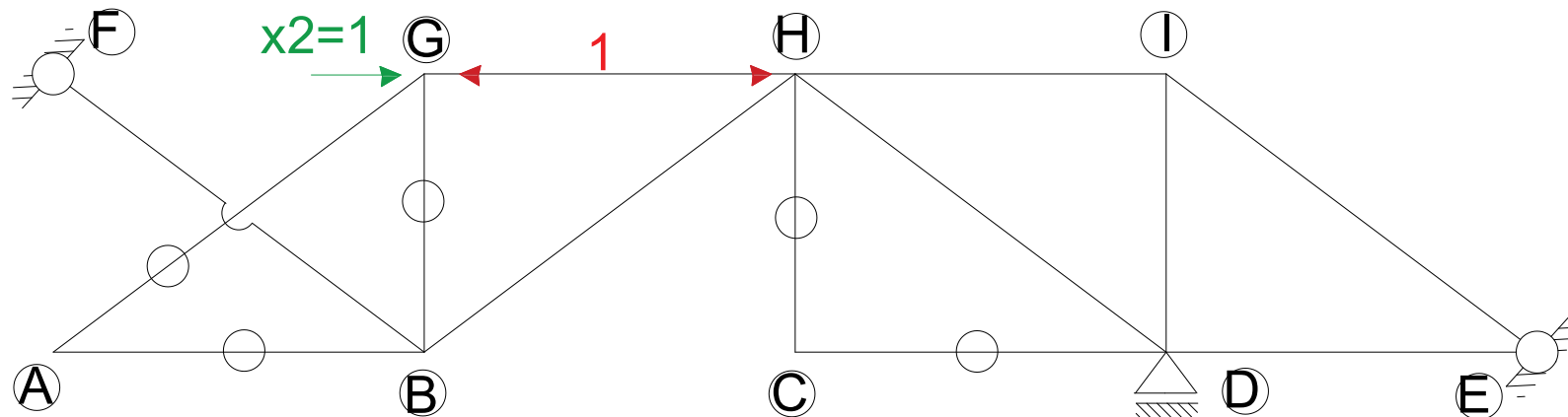


$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$

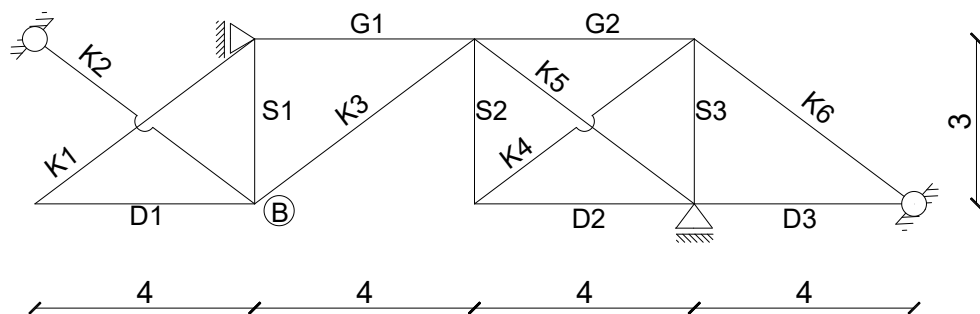


Wykresy: stan $x_2=1$ – siły N2

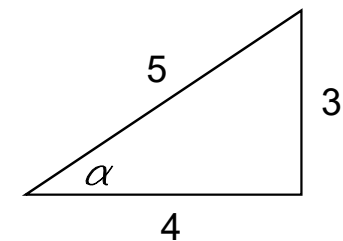
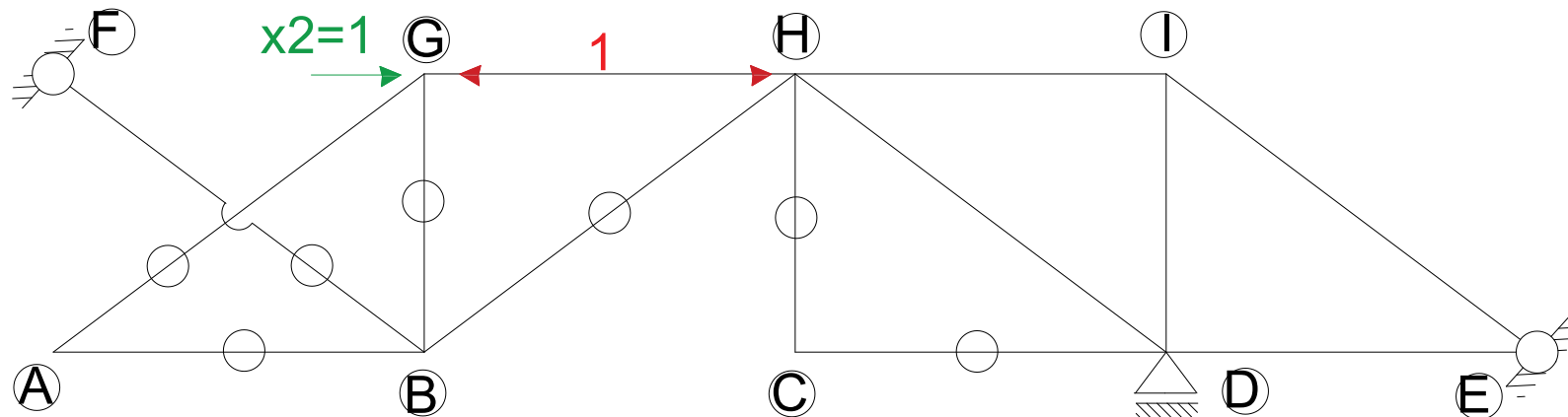


$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$

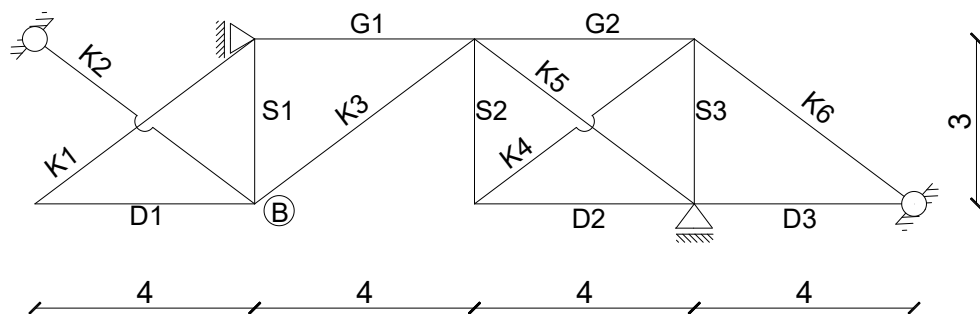


Wykresy: stan $x_2=1$ – siły N2

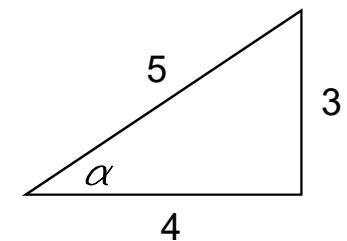
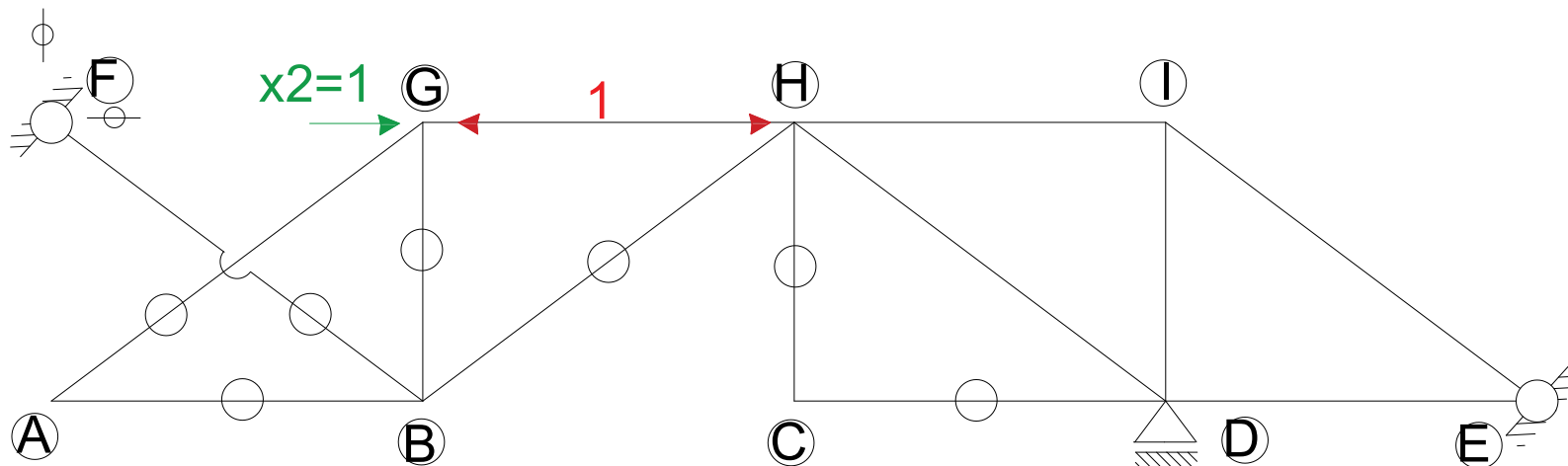


$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$

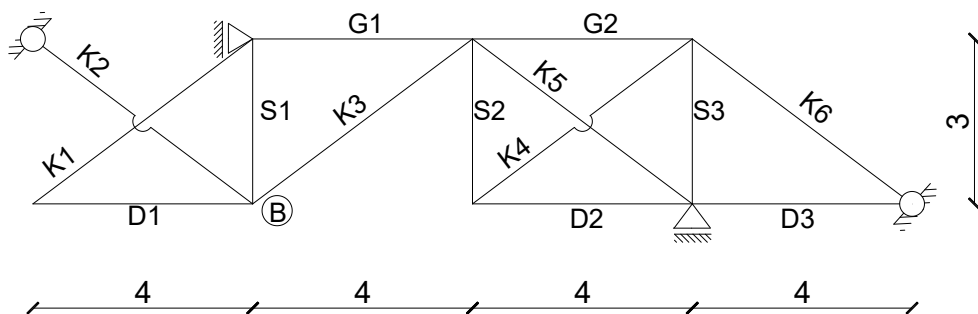


Wykresy: stan $x_2=1$ – siły N2

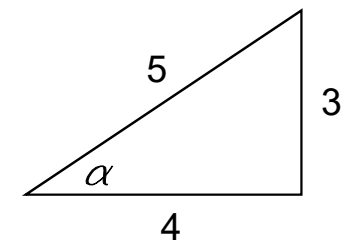
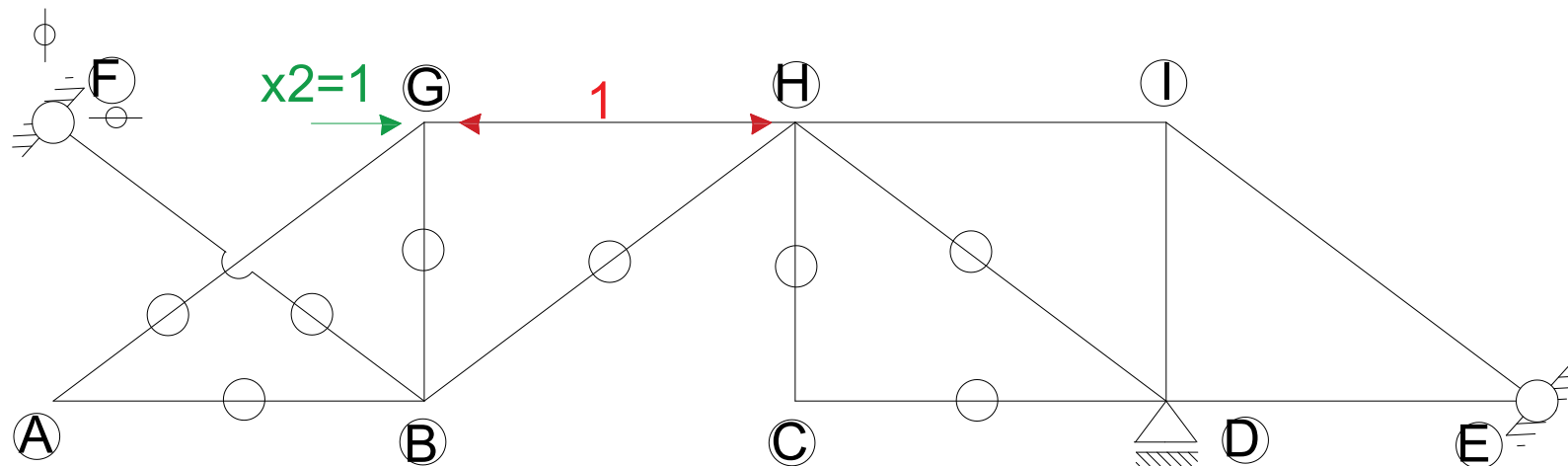


$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$

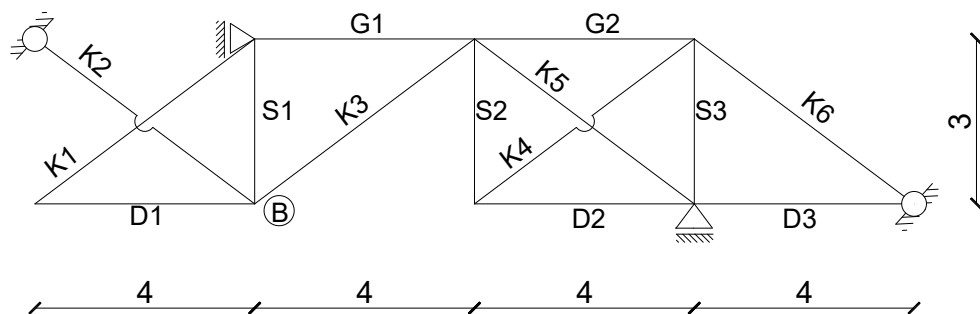


Wykresy: stan $x_2=1$ – siły N2

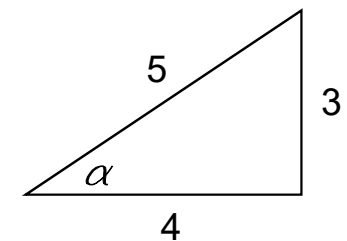
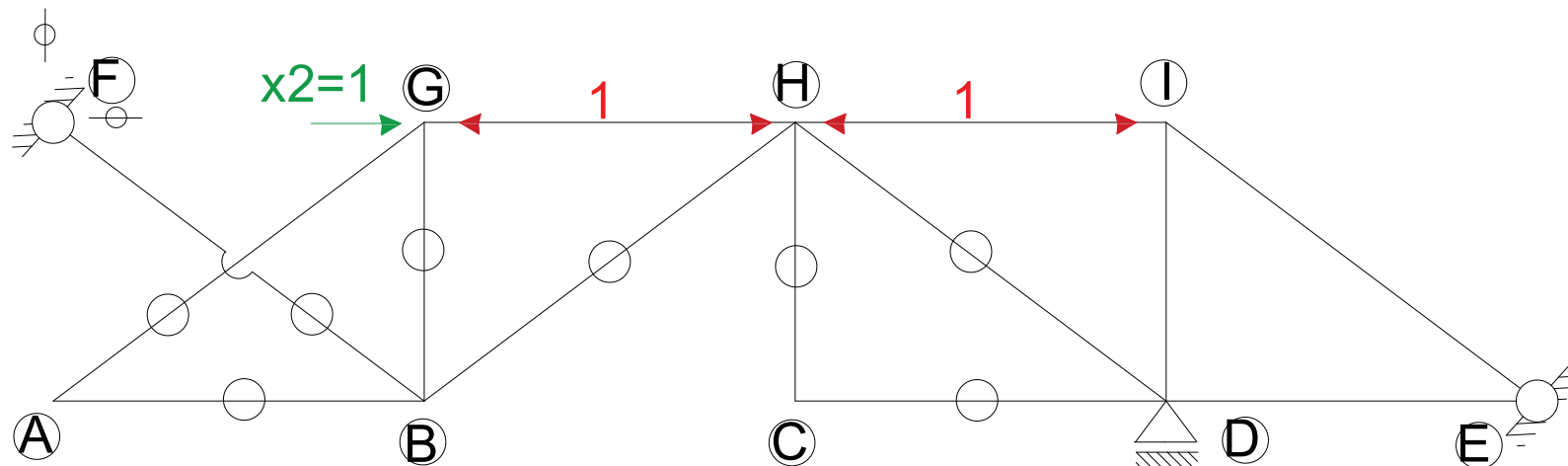


$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$

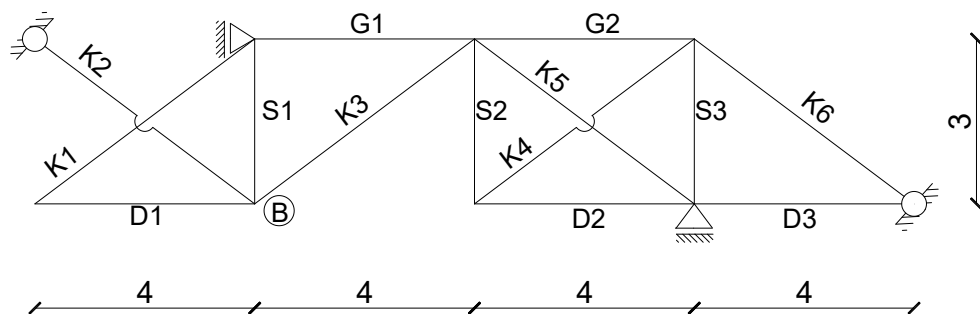


Wykresy: stan $x_2=1$ – siły N2

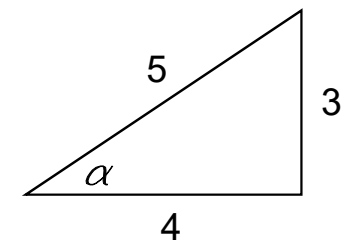
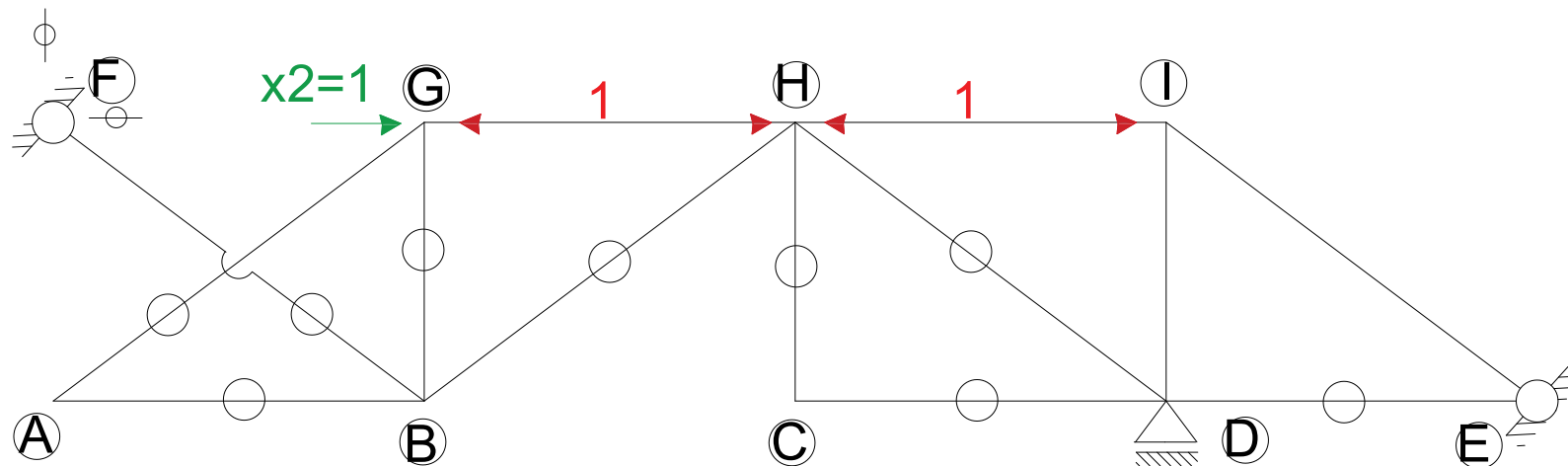


$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$

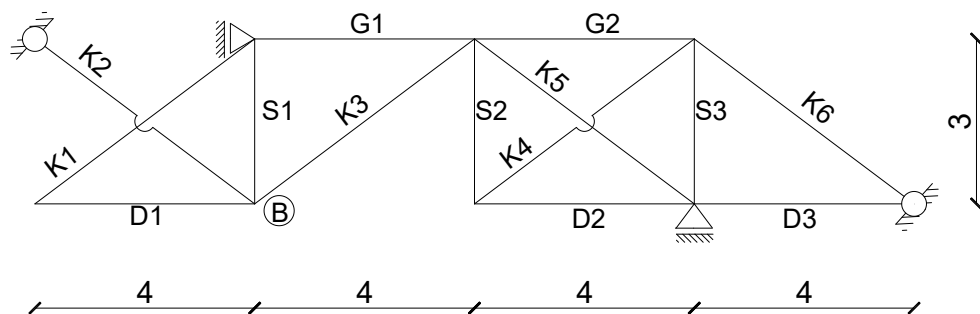


Wykresy: stan $x_2=1$ – siły N2

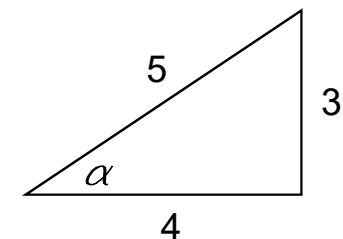
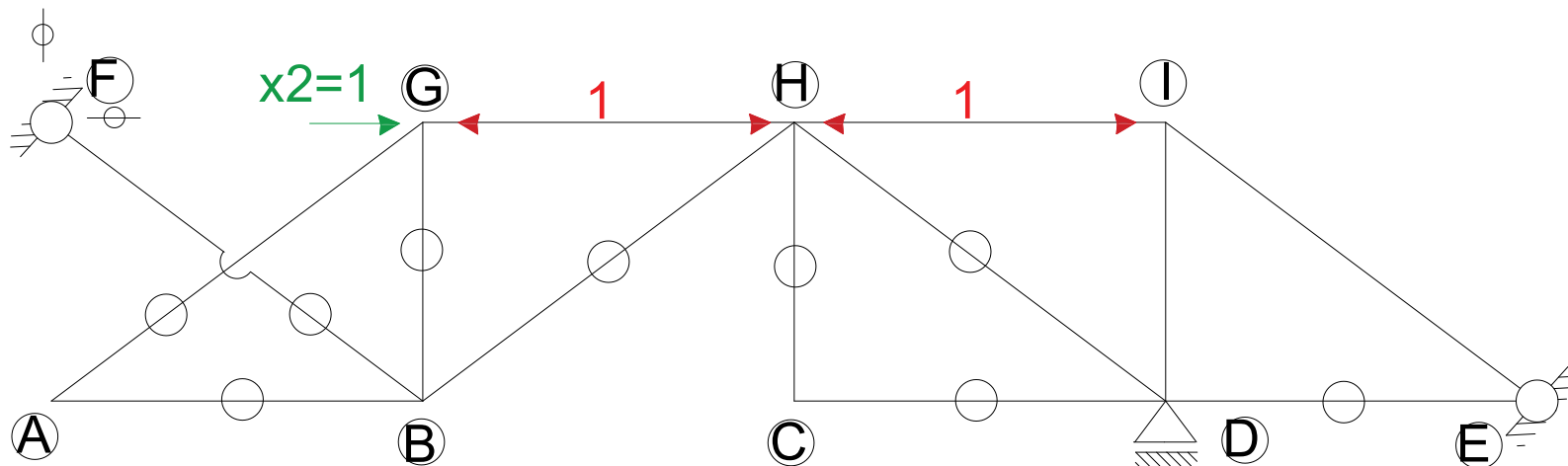


$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$

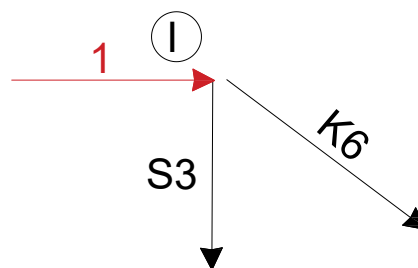
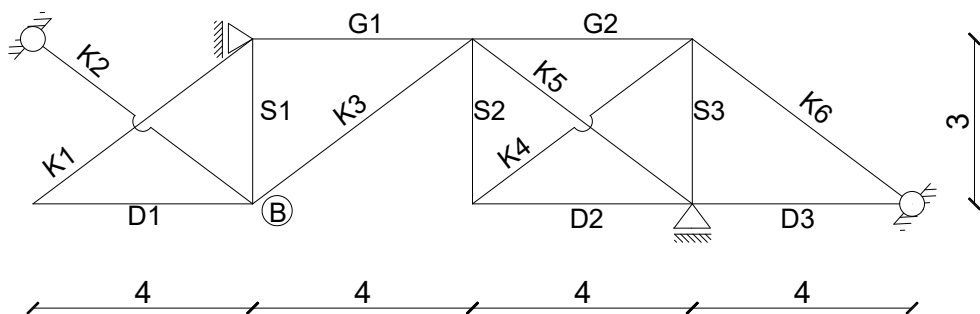


Wykresy: stan $x_2=1$ – siły N2

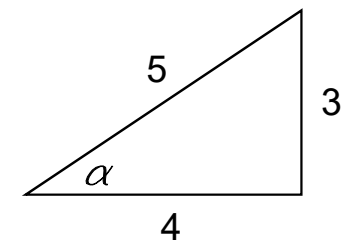
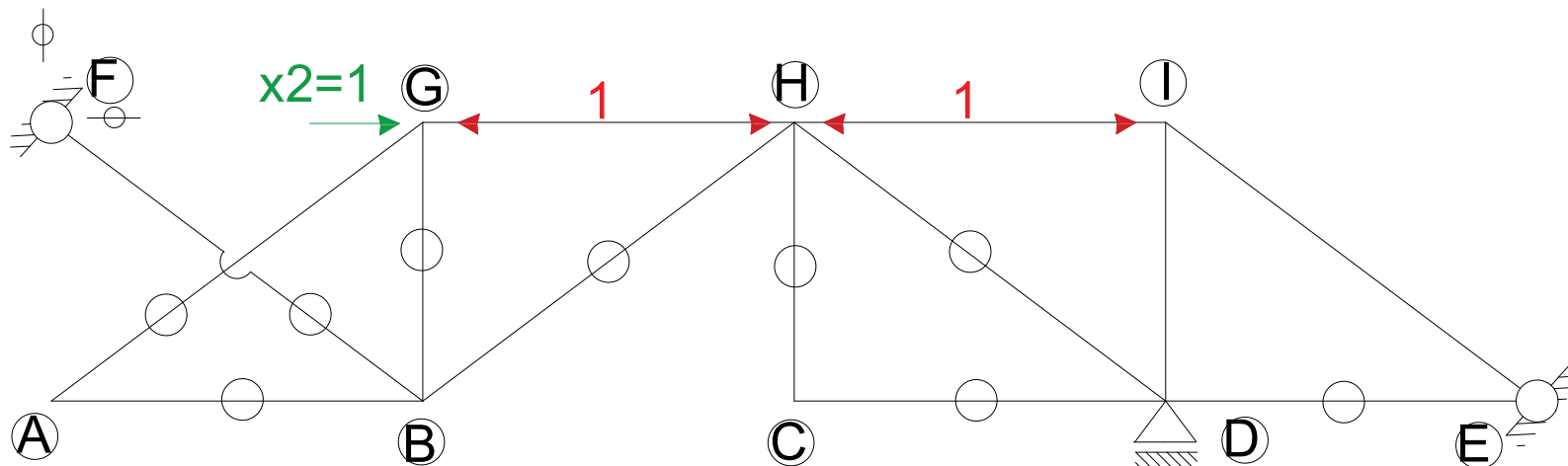


$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$

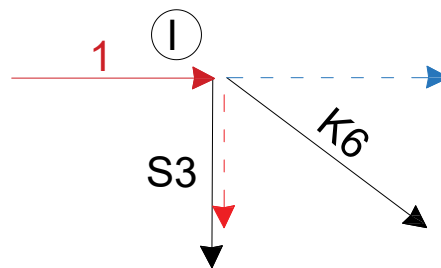
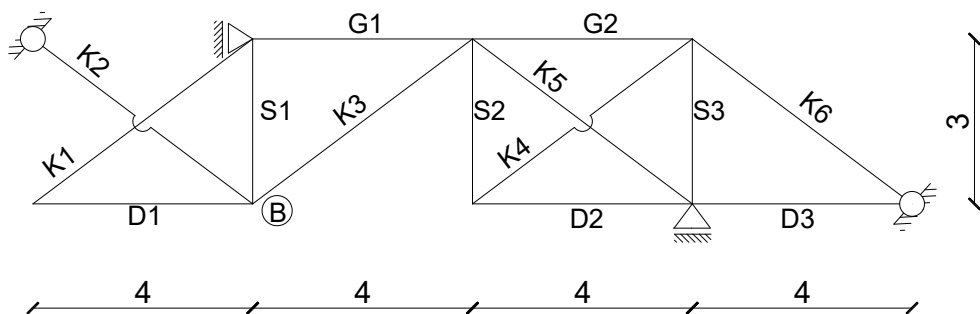


Wykresy: stan $x_2=1$ – siły N2

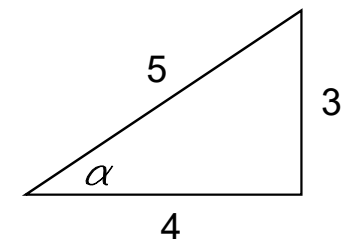
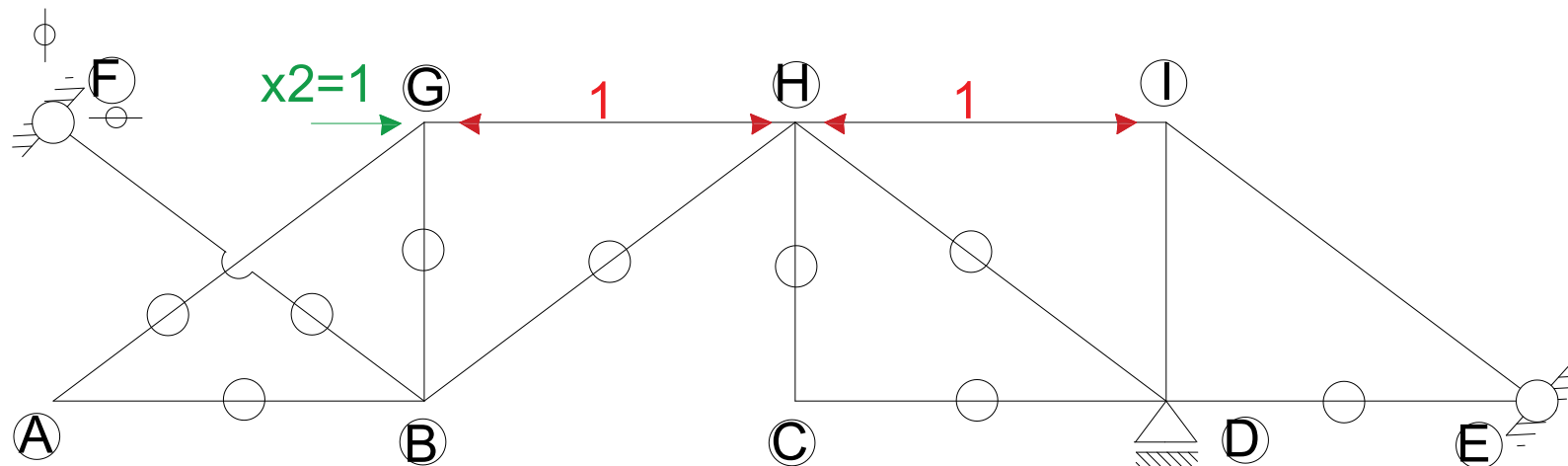


$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$

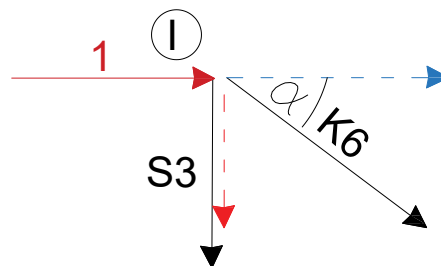
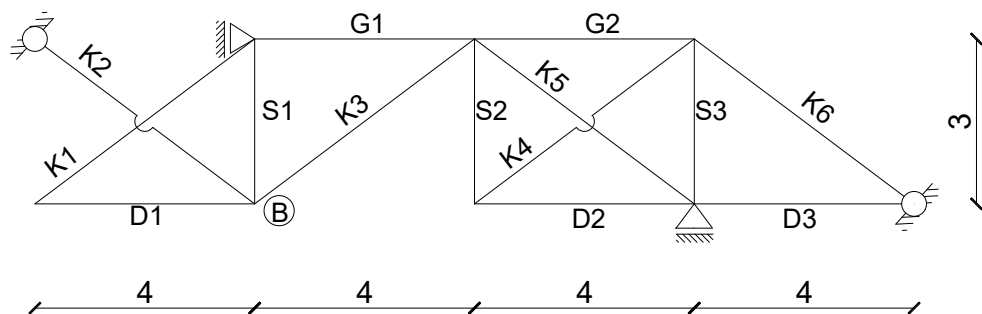


Wykresy: stan $x_2=1$ – siły N2

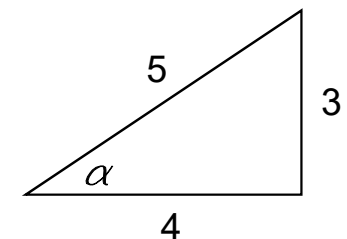
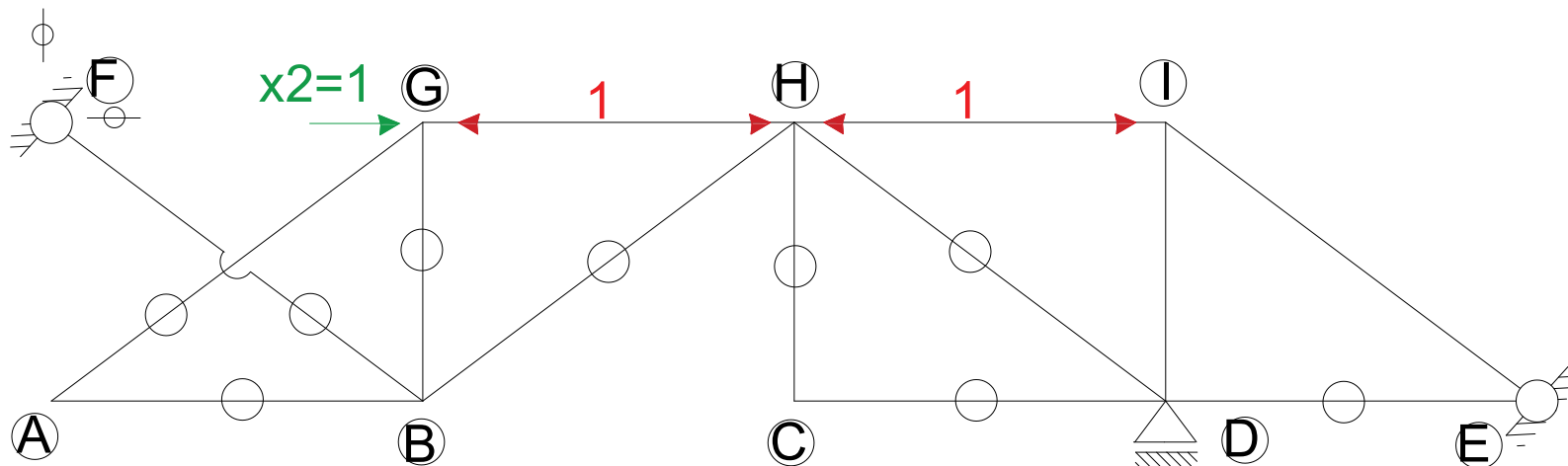


$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$

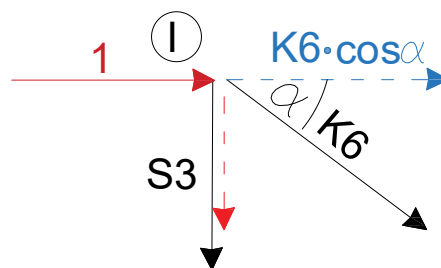
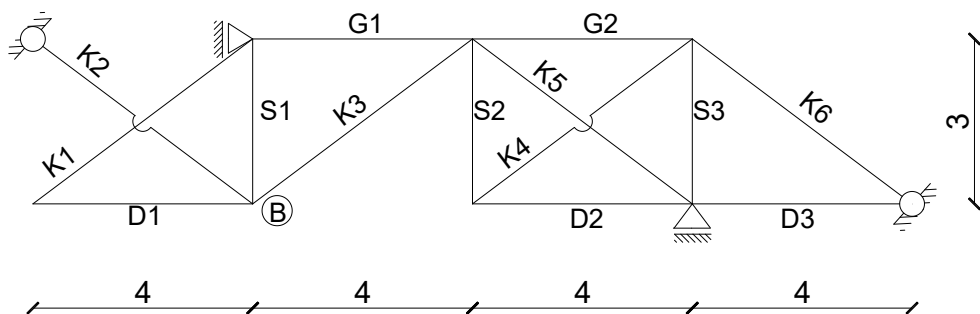


Wykresy: stan $x_2=1$ – siły N2

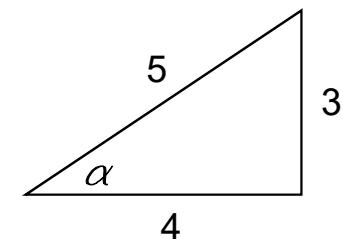
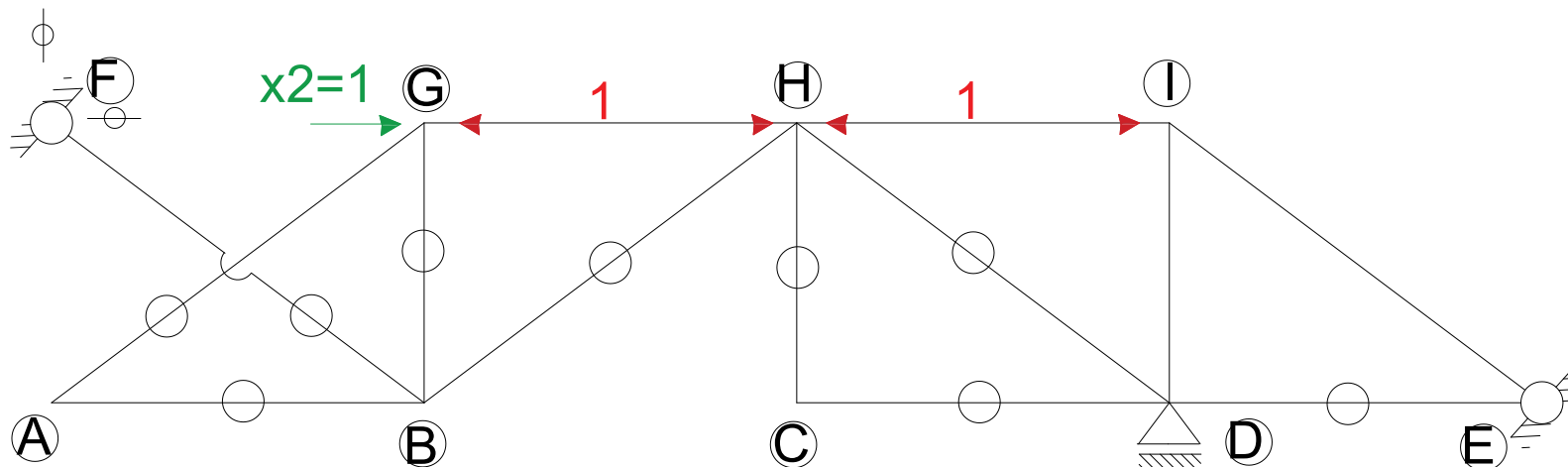


$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$

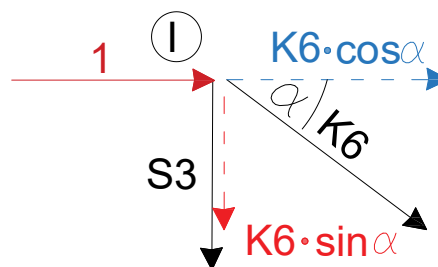
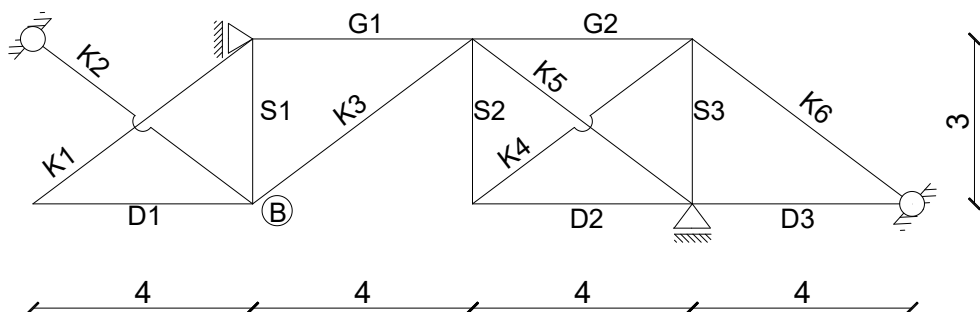


Wykresy: stan $x_2=1$ – siły N2

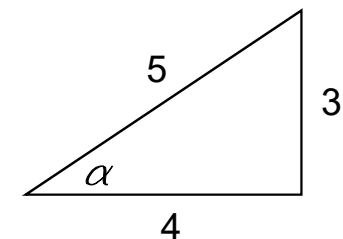
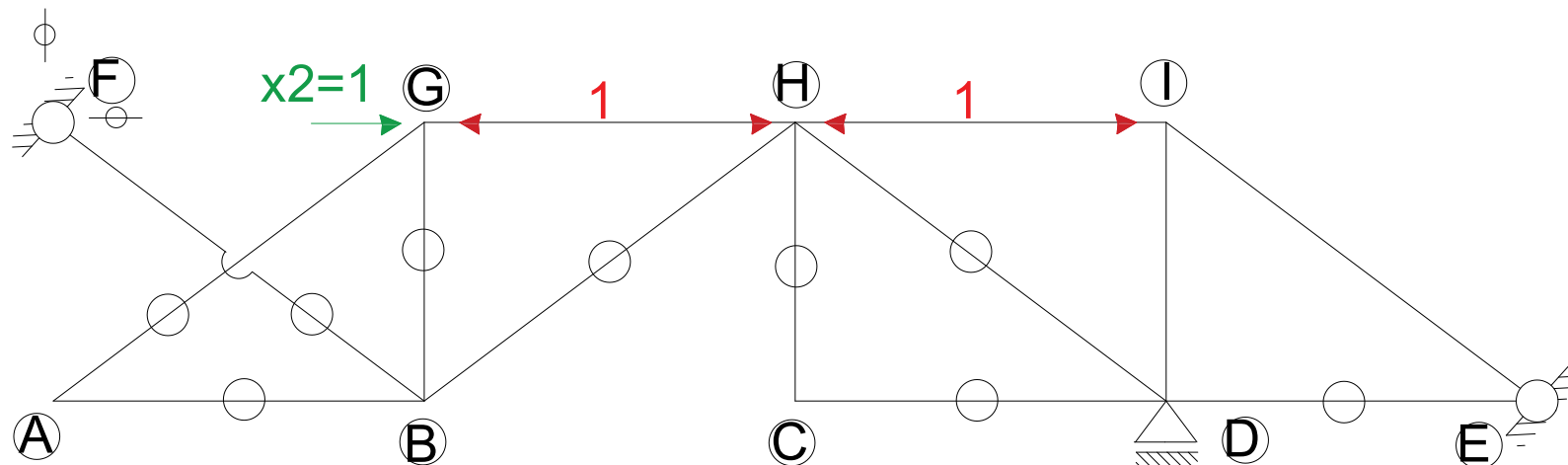


$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$



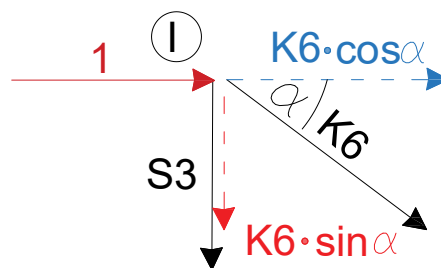
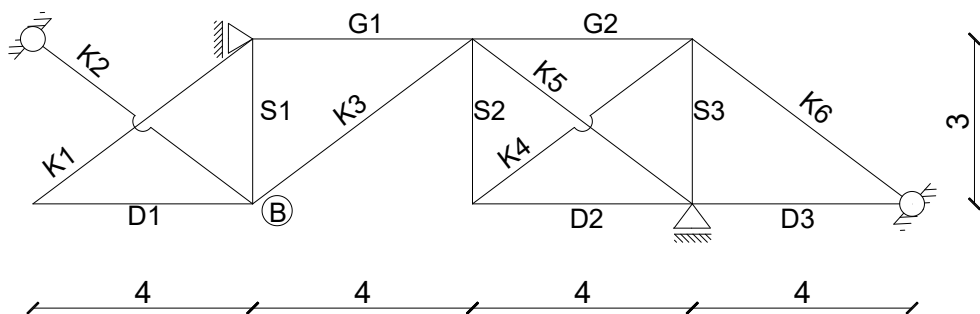
Wykresy: stan $x_2=1$ – siły N2



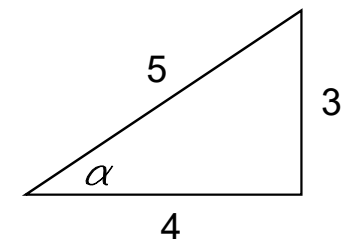
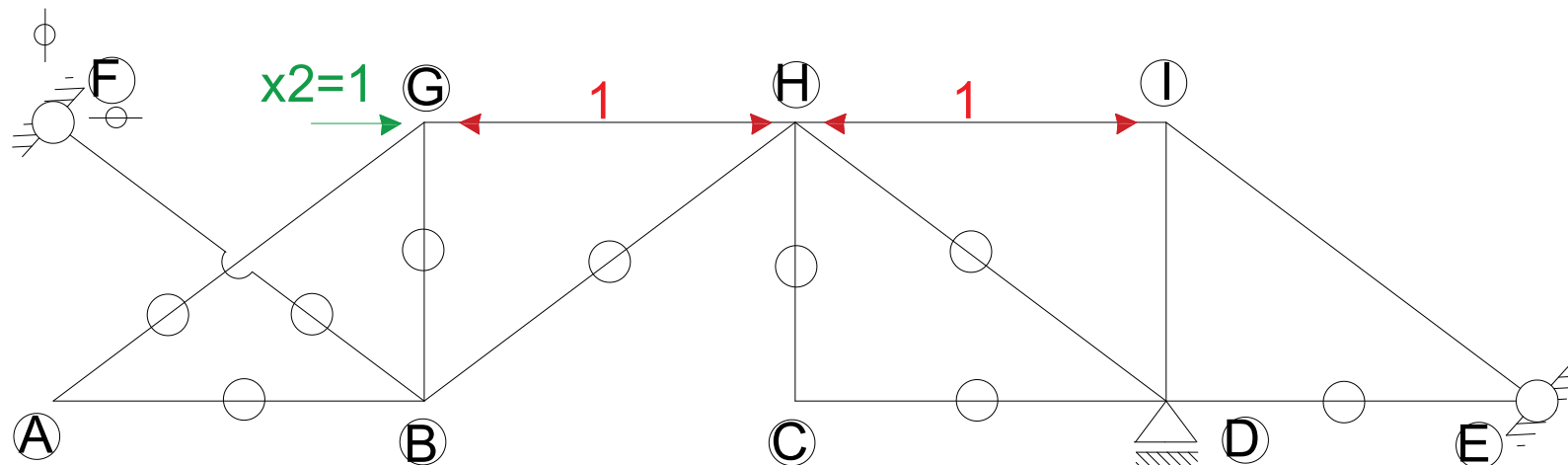
$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$

$$\sum R_x = 1 + K_6 \cdot \cos \alpha = 0$$

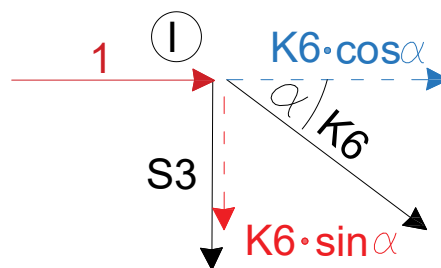
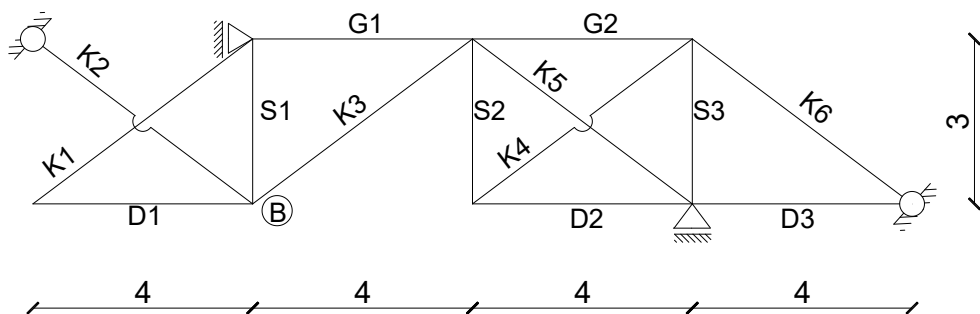


Wykresy: stan $x_2=1$ – siły N2



$$\cos \alpha = \frac{4}{5} = 0,8$$

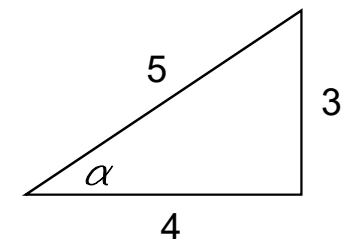
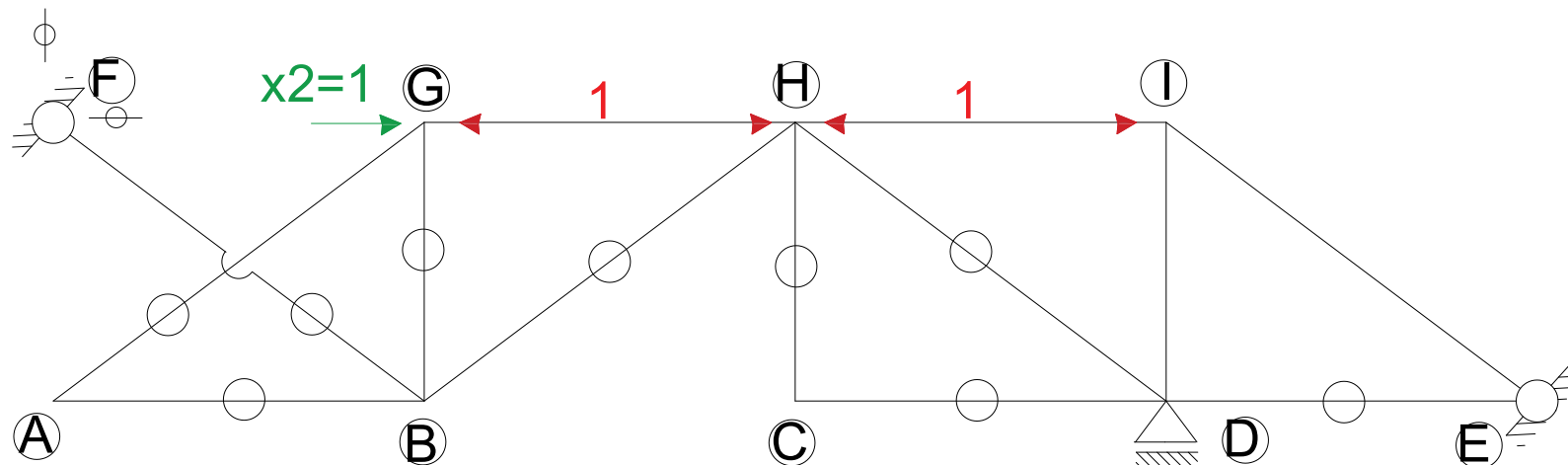
$$\sin \alpha = \frac{3}{5} = 0,6$$



$$\sum R_x = 1 + K_6 \cdot \cos \alpha = 0$$

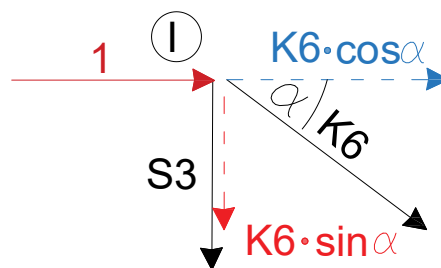
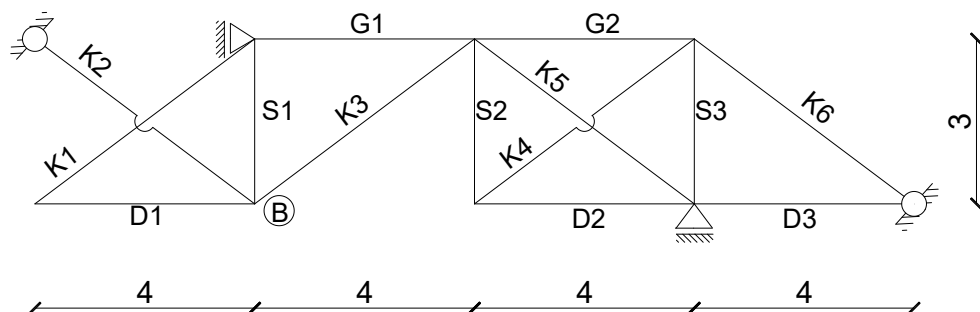


Wykresy: stan $x_2=1$ – siły N2



$$\cos \alpha = \frac{4}{5} = 0,8$$

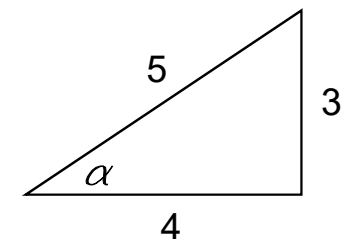
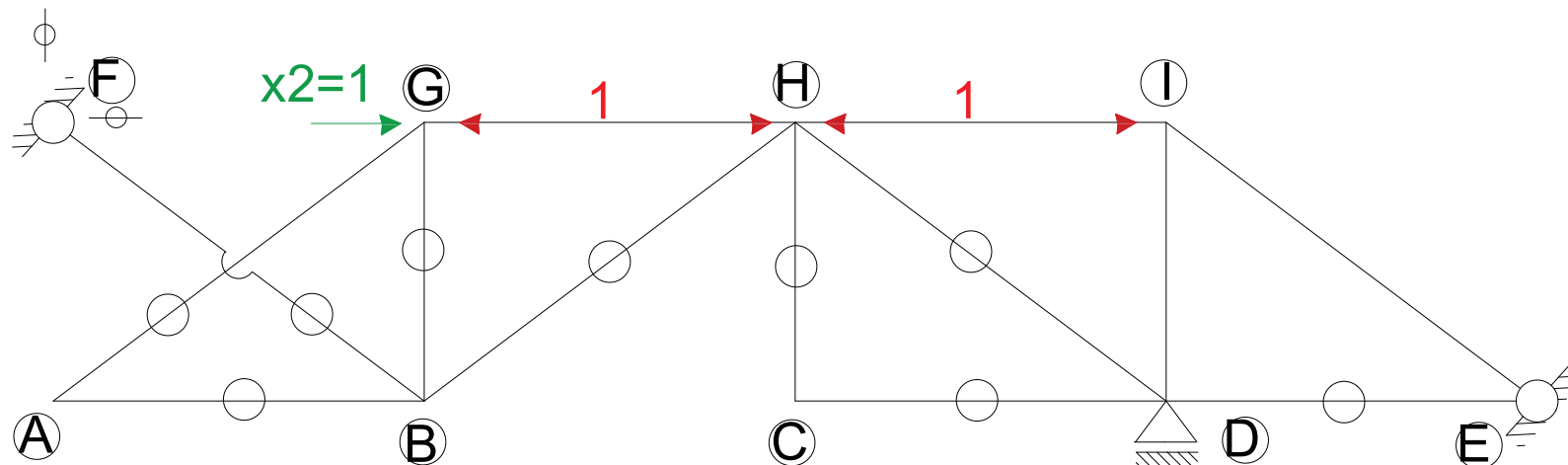
$$\sin \alpha = \frac{3}{5} = 0,6$$



$$\sum R_x = 1 + K6 \cdot \cos \alpha = 0$$

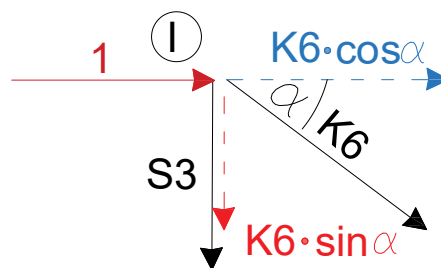
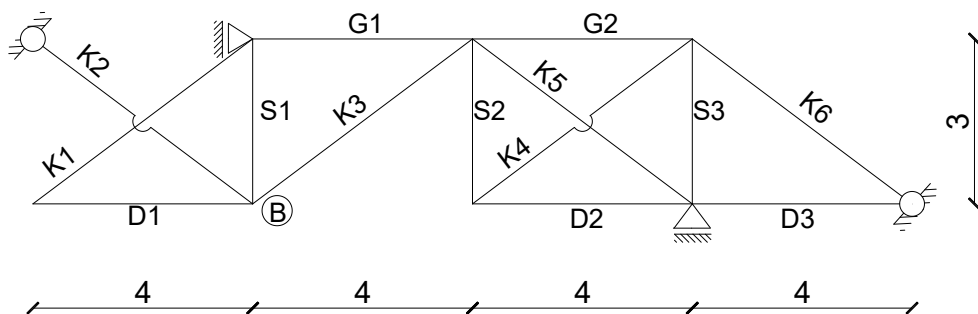
$$K6 = -\frac{1}{\cos \alpha}$$

Wykresy: stan $x_2=1$ – siły N2



$$\cos \alpha = \frac{4}{5} = 0,8$$

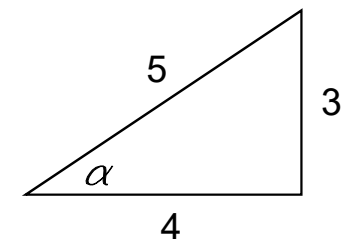
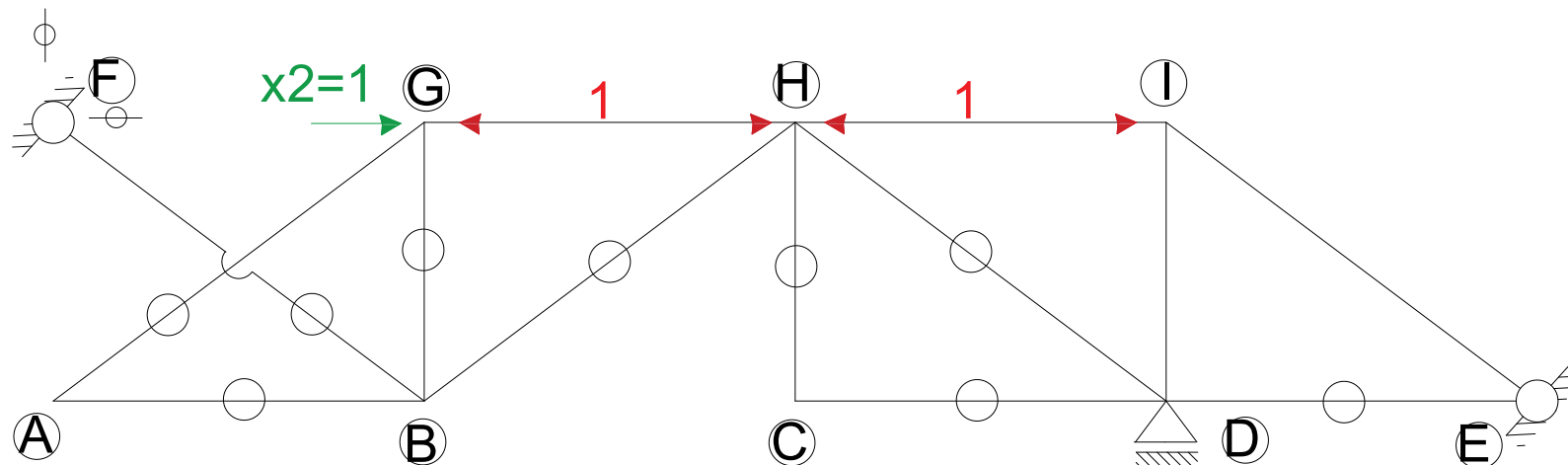
$$\sin \alpha = \frac{3}{5} = 0,6$$



$$\sum R_x = 1 + K6 \cdot \cos \alpha = 0$$

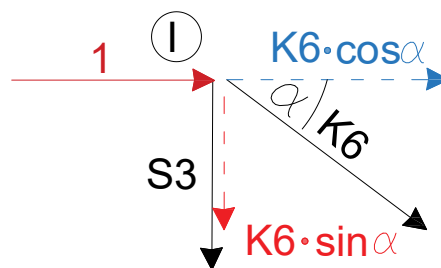
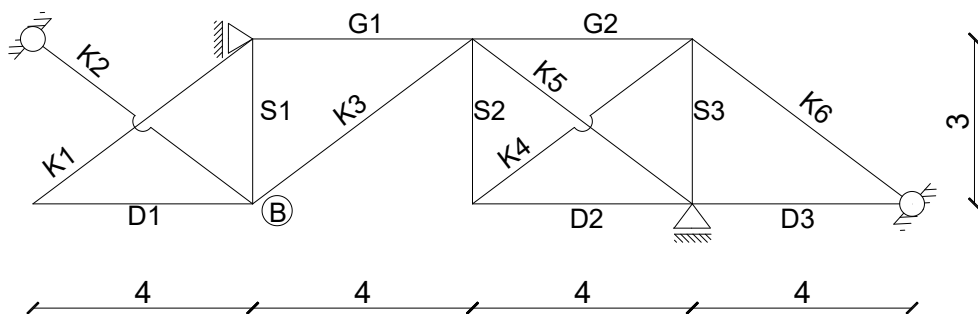
$$K6 = -\frac{1}{\cos \alpha} = -\frac{5}{4}$$

Wykresy: stan $x_2=1$ – siły N2



$$\cos \alpha = \frac{4}{5} = 0,8$$

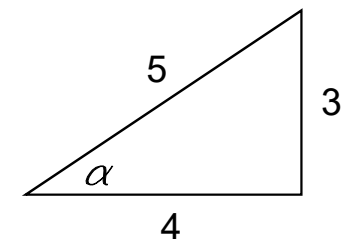
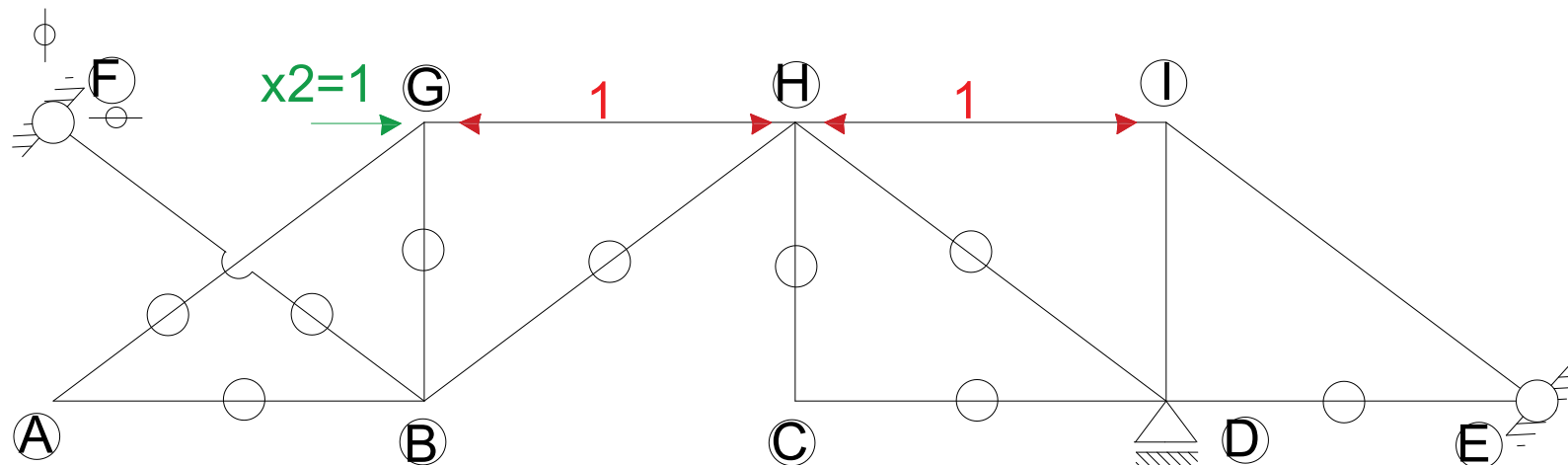
$$\sin \alpha = \frac{3}{5} = 0,6$$



$$\sum R_x = 1 + K6 \cdot \cos \alpha = 0$$

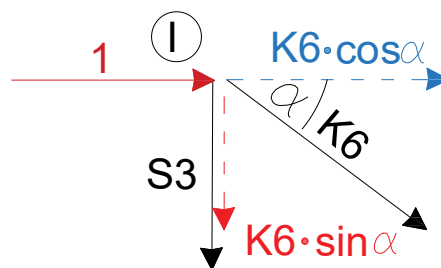
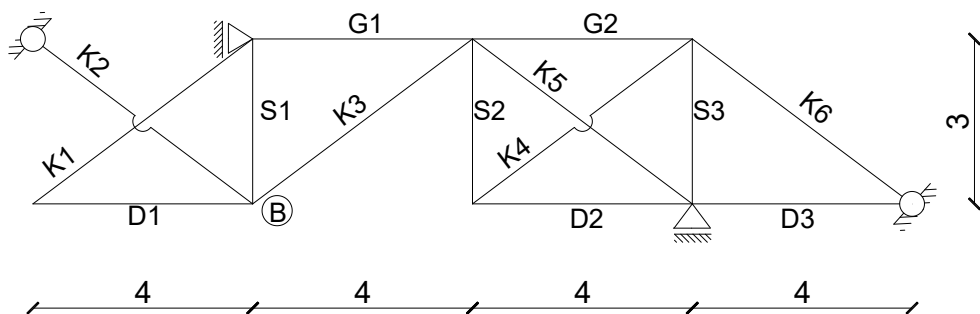
$$K6 = -\frac{1}{\cos \alpha} = -\frac{5}{4} = -1,25$$

Wykresy: stan $x_2=1$ – siły N2



$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$

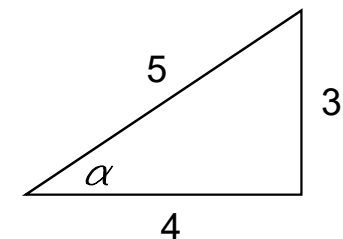
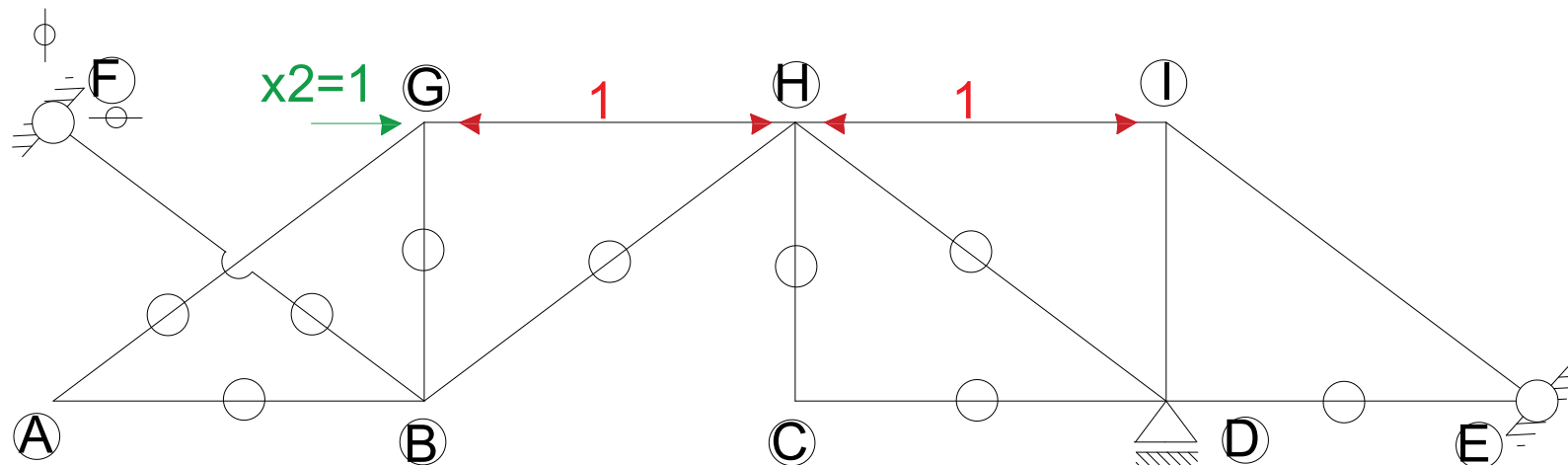


$$\sum R_x = 1 + K6 \cdot \cos \alpha = 0$$

$$K6 = -\frac{1}{\cos \alpha} = -\frac{5}{4} = -1,25$$

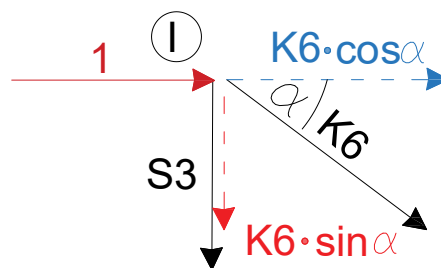
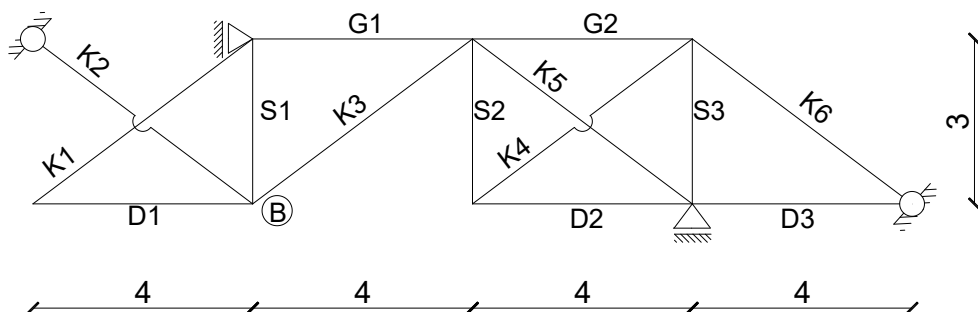
$$\sum R_y = -S3 - K6 \cdot \sin \alpha = 0$$

Wykresy: stan $x_2=1$ – siły N2



$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$



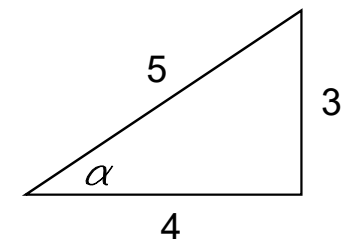
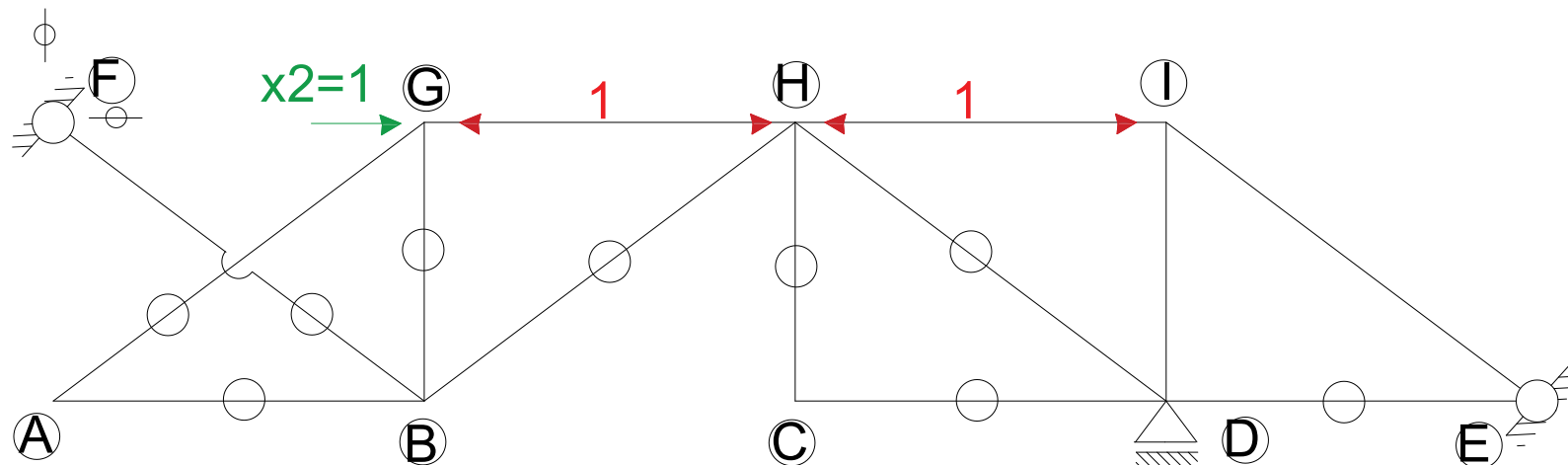
$$\sum R_x = 1 + K6 \cdot \cos \alpha = 0$$

$$K6 = -\frac{1}{\cos \alpha} = -\frac{5}{4} = -1,25$$

$$\sum R_y = -S3 - K6 \cdot \sin \alpha = 0$$

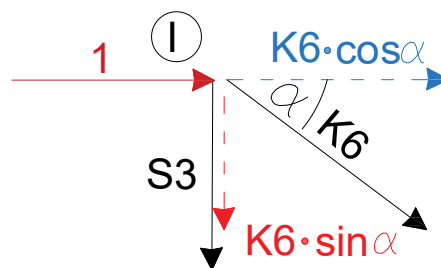
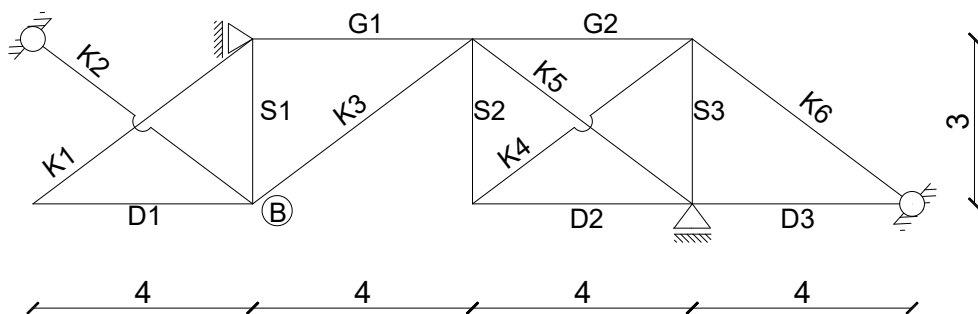
$$S3 = -K6 \cdot \sin \alpha$$

Wykresy: stan $x_2=1$ – siły N2



$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$



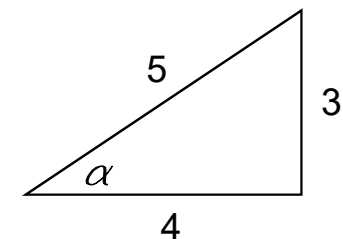
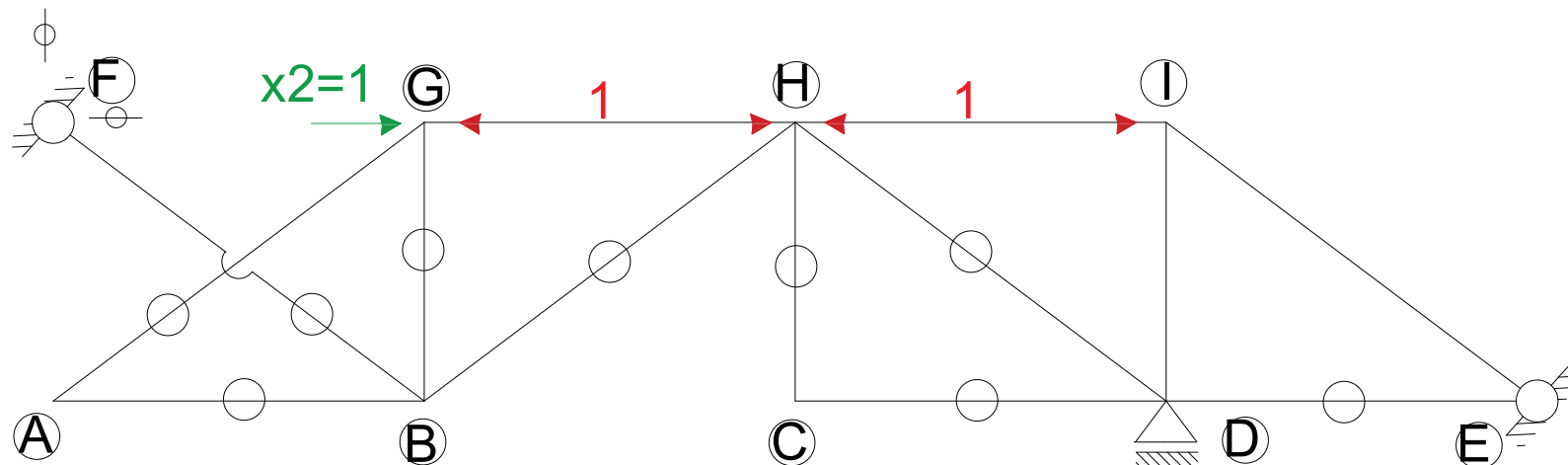
$$\sum R_x = 1 + K6 \cdot \cos \alpha = 0$$

$$K6 = -\frac{1}{\cos \alpha} = -\frac{5}{4} = -1,25$$

$$\sum R_y = -S3 - K6 \cdot \sin \alpha = 0$$

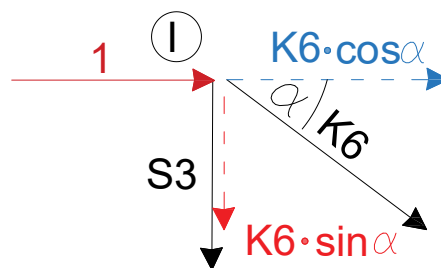
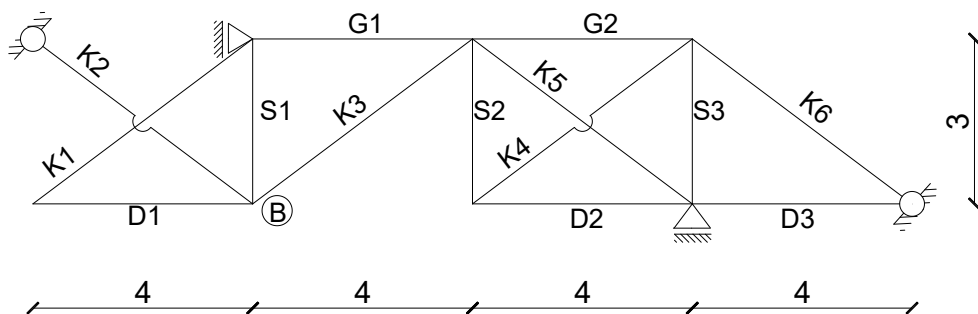
$$S3 = -K6 \cdot \sin \alpha = -\left(-\frac{5}{4}\right) \cdot \frac{3}{5}$$

Wykresy: stan $x_2=1$ – siły N2



$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$



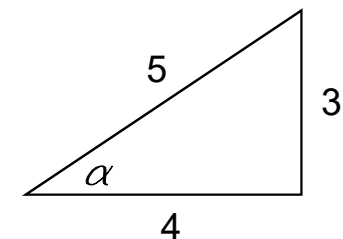
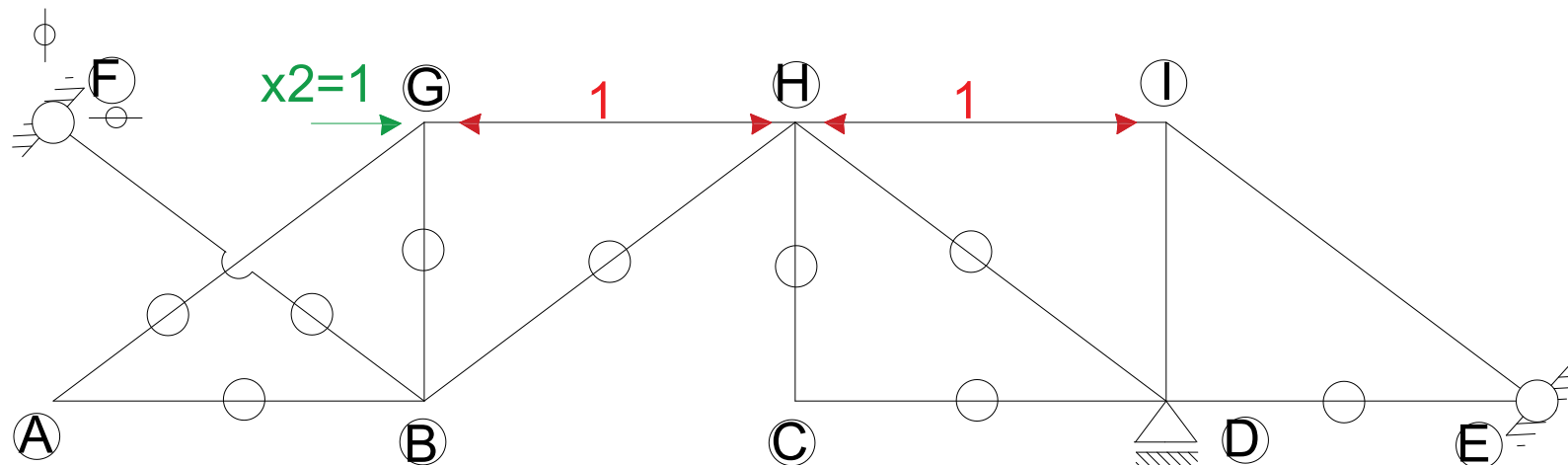
$$\sum R_x = 1 + K6 \cdot \cos \alpha = 0$$

$$K6 = -\frac{1}{\cos \alpha} = -\frac{5}{4} = -1,25$$

$$\sum R_y = -S3 - K6 \cdot \sin \alpha = 0$$

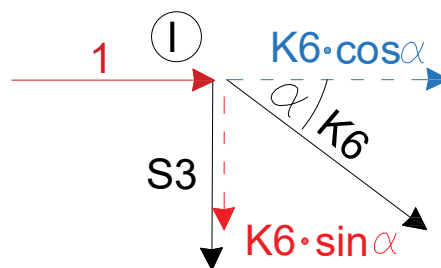
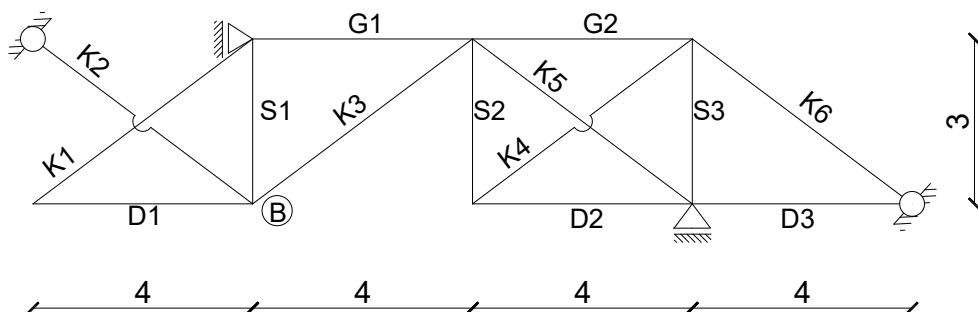
$$S3 = -K6 \cdot \sin \alpha = -\left(-\frac{5}{4}\right) \cdot \frac{3}{5} = \frac{3}{4}$$

Wykresy: stan $x_2=1$ – siły N2



$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$



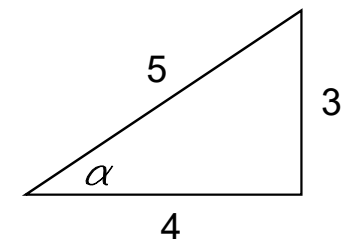
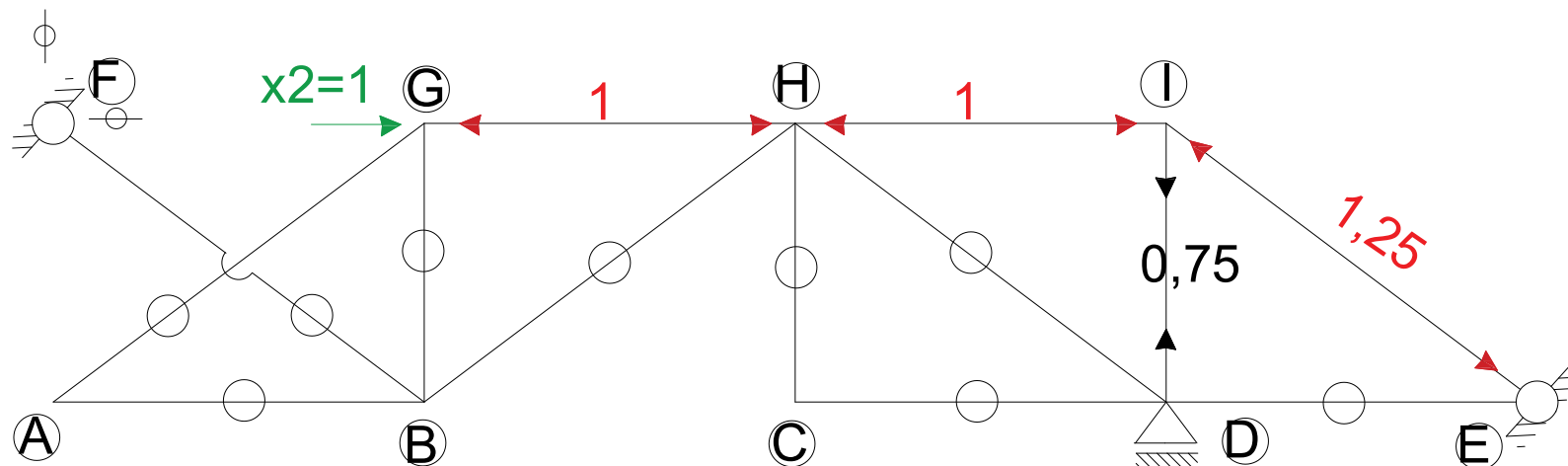
$$\sum R_x = 1 + K6 \cdot \cos \alpha = 0$$

$$K6 = -\frac{1}{\cos \alpha} = -\frac{5}{4} = -1,25$$

$$\sum R_y = -S3 - K6 \cdot \sin \alpha = 0$$

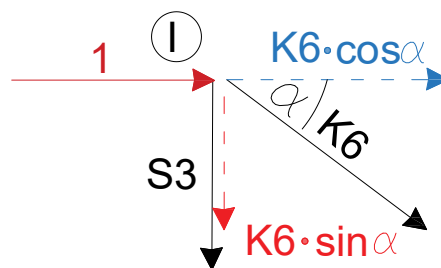
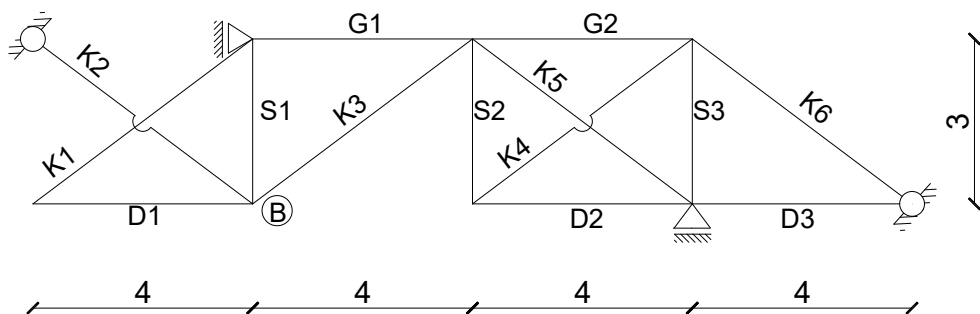
$$S3 = -K6 \cdot \sin \alpha = -\left(-\frac{5}{4}\right) \cdot \frac{3}{5} = \frac{3}{4} = 0,75$$

Wykresy: stan $x_2=1$ – siły N2



$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$



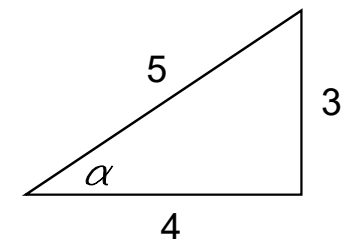
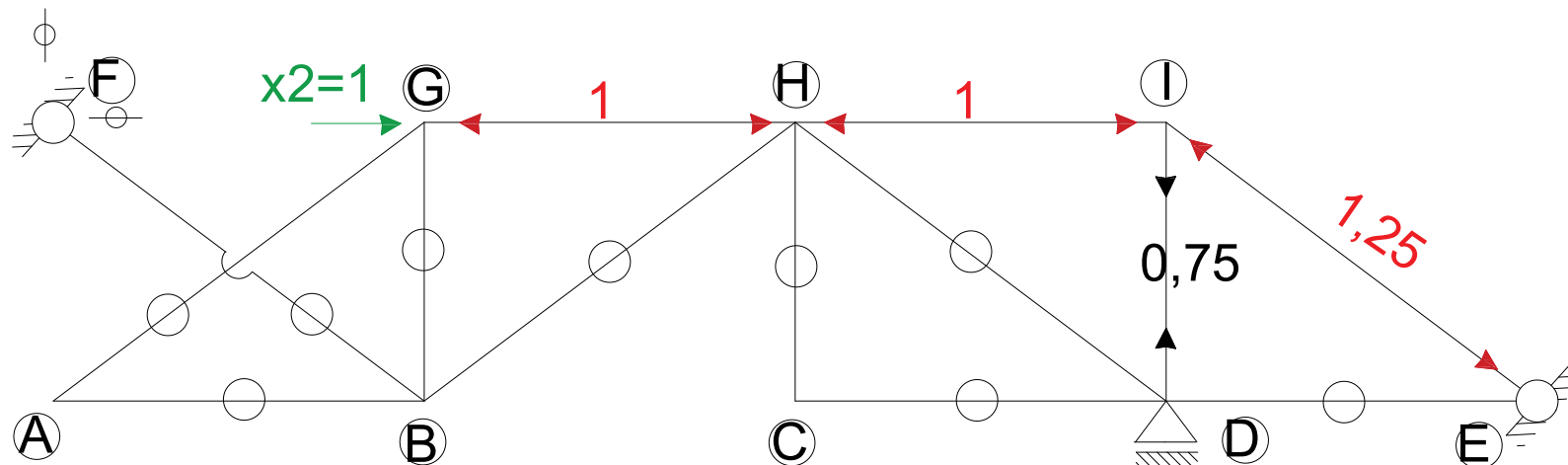
$$\sum R_x = 1 + K6 \cdot \cos \alpha = 0$$

$$K6 = -\frac{1}{\cos \alpha} = -\frac{5}{4} = -1,25$$

$$\sum R_y = -S3 - K6 \cdot \sin \alpha = 0$$

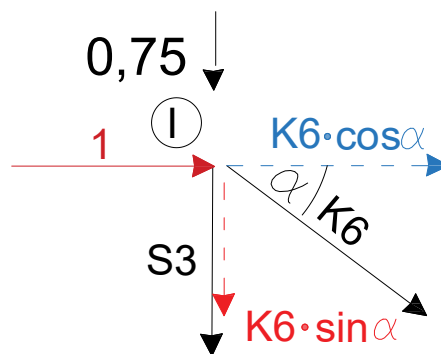
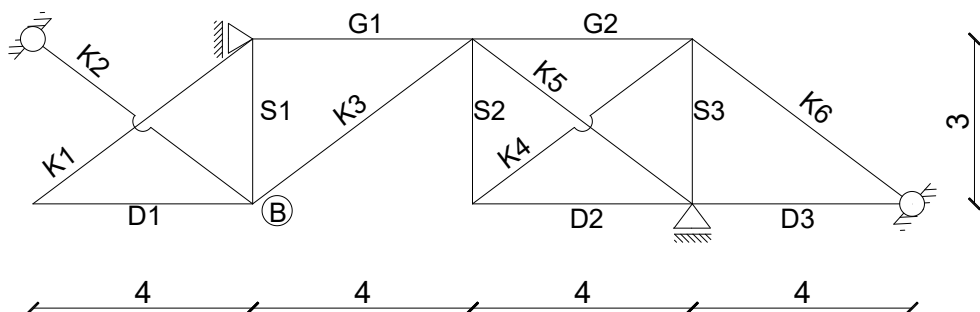
$$S3 = -K6 \cdot \sin \alpha = -\left(-\frac{5}{4}\right) \cdot \frac{3}{5} = \frac{3}{4} = 0,75$$

Wykresy: stan $x_2=1$ – siły N2



$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$



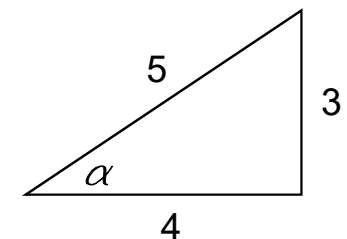
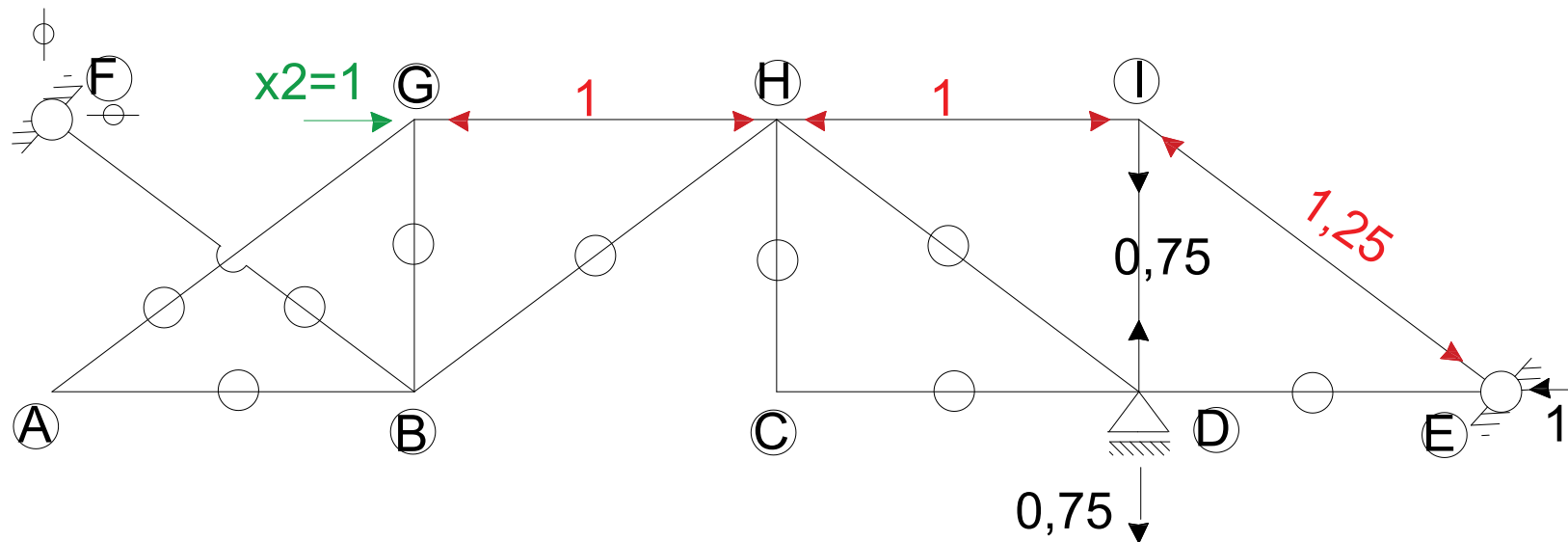
$$\sum R_x = 1 + K6 \cdot \cos \alpha = 0$$

$$K6 = -\frac{1}{\cos \alpha} = -\frac{5}{4} = -1,25$$

$$\sum R_Y = -S3 - K6 \cdot \sin \alpha = 0$$

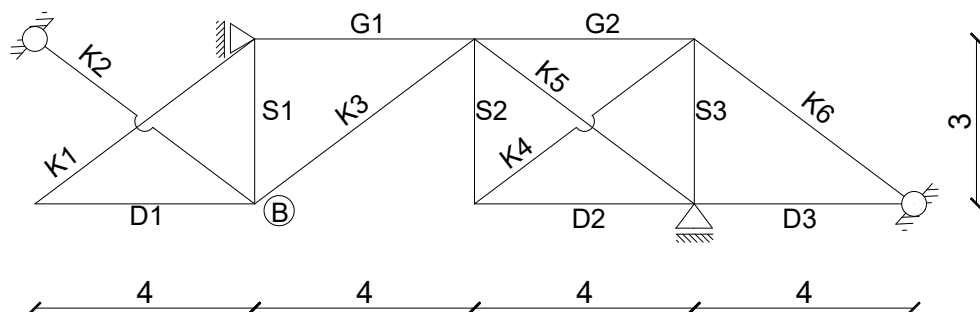
$$S3 = -K6 \cdot \sin \alpha = -\left(-\frac{5}{4}\right) \cdot \frac{3}{5} = \frac{3}{4} = 0,75$$

Wykresy: stan $x_2=1$ – siły N2

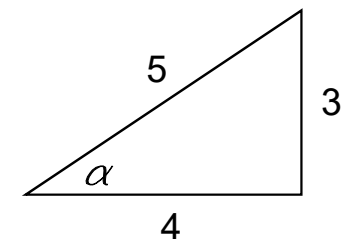
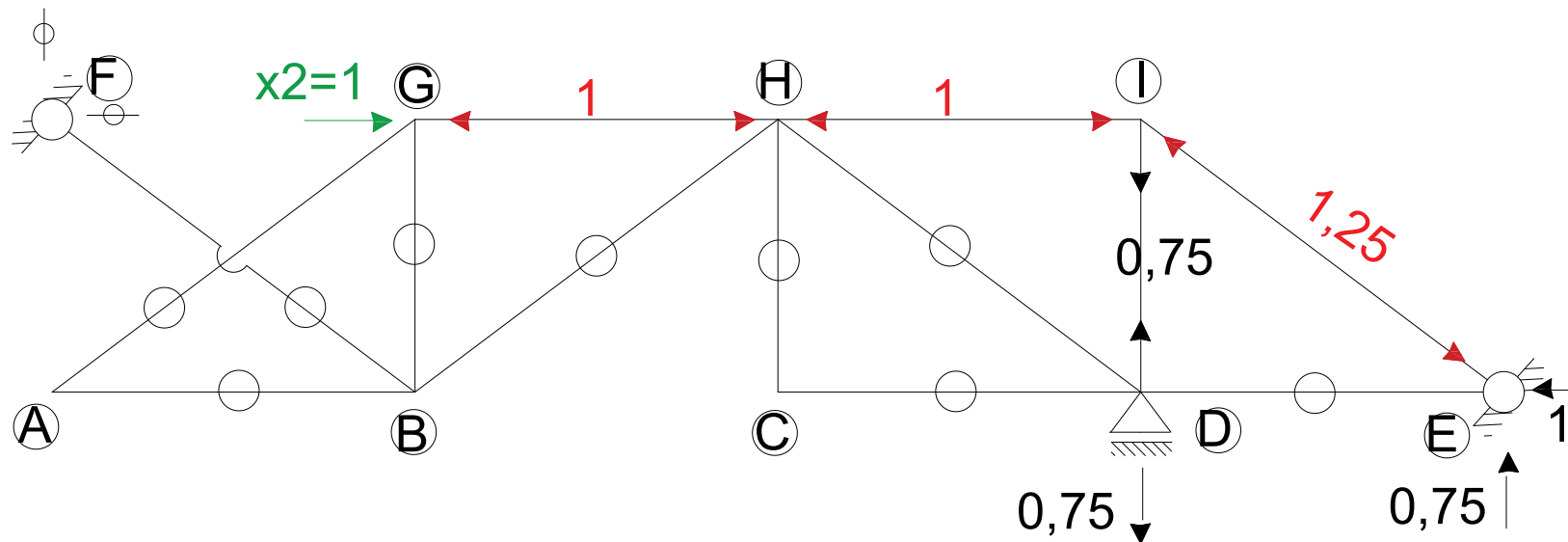


$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$

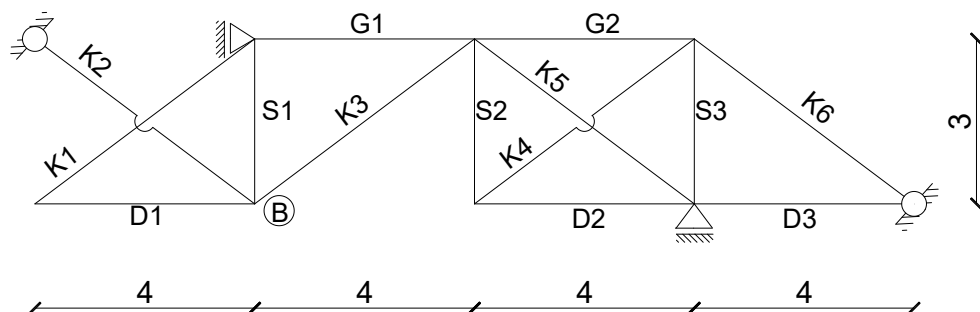


Wykresy: stan $x_2=1$ – siły N2

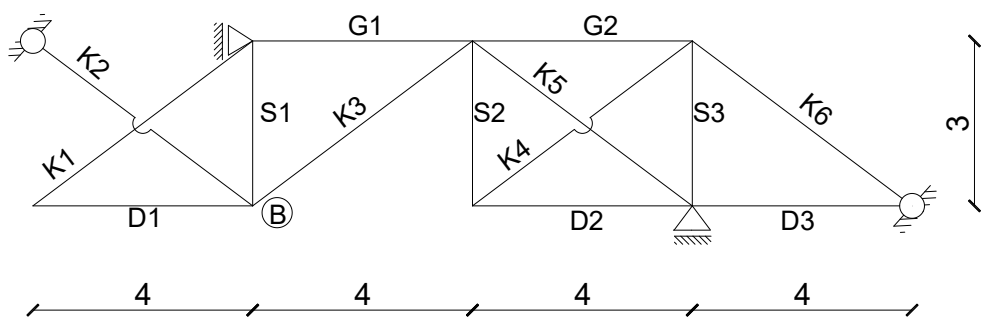
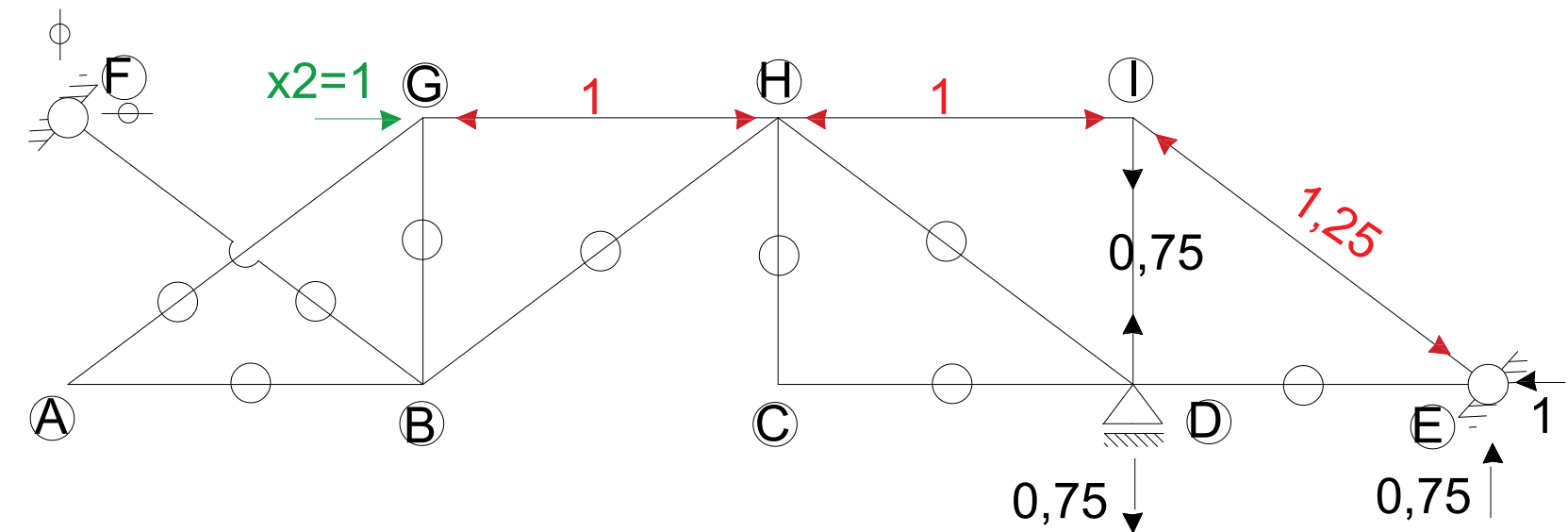


$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$

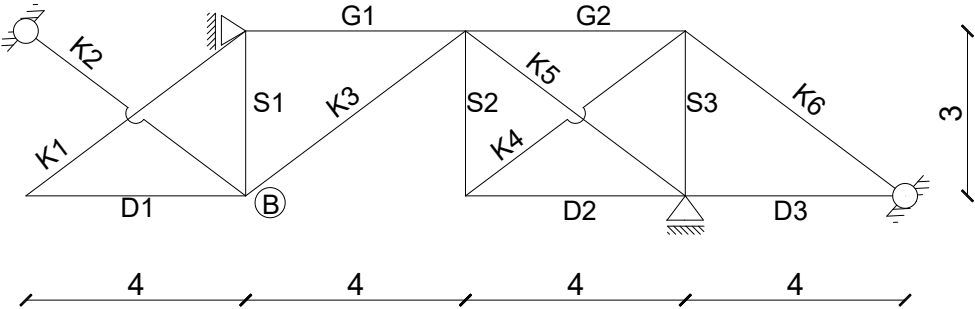
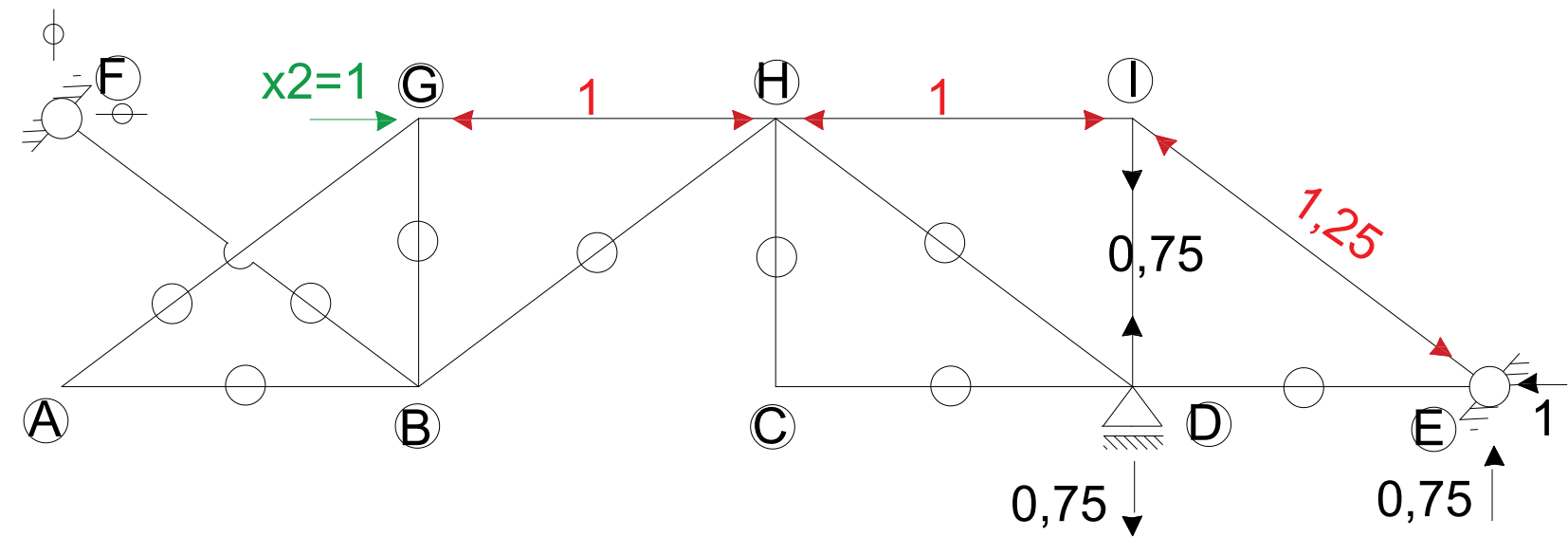


Wykresy: stan $x_2=1$ – siły N2



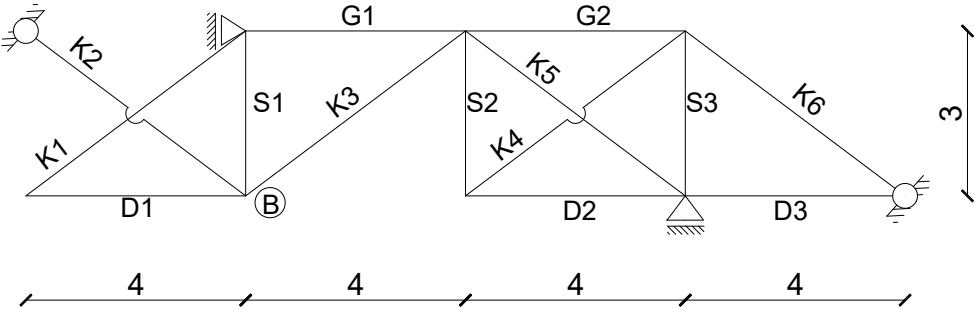
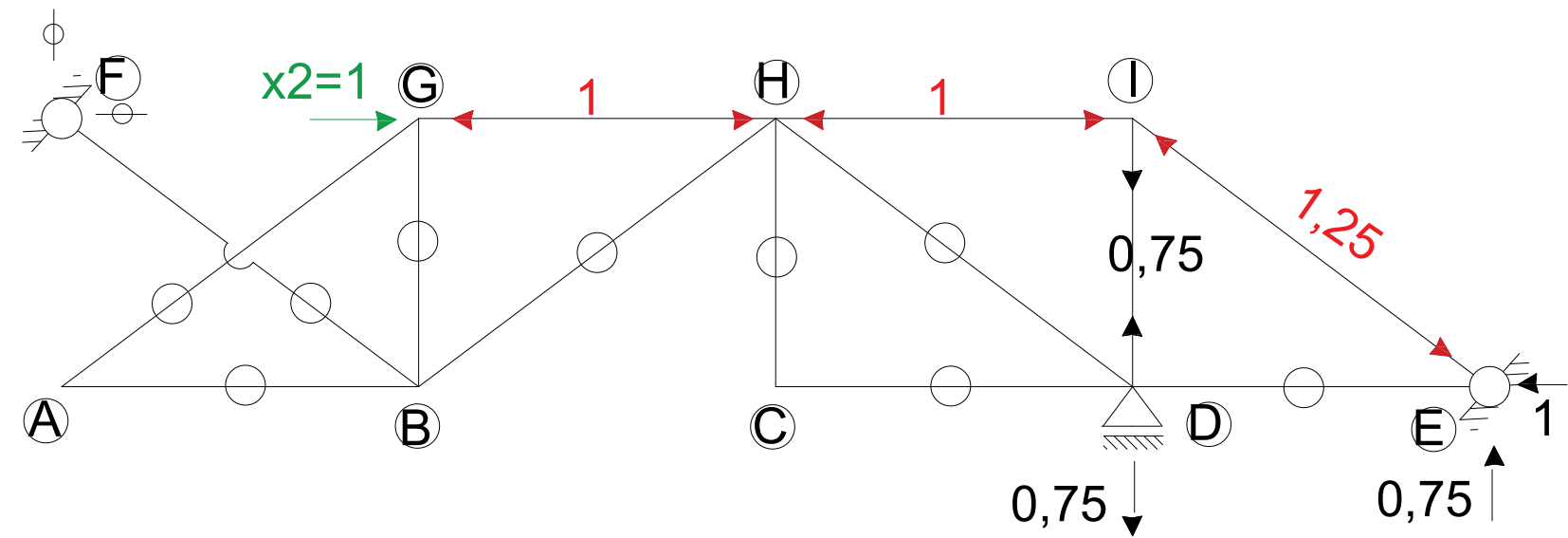
Pręt	L/EA	N2
D1	4	
D2	4	
D3	4	
G1	4	
G2	4	
S1	3	
S2	3	
S3	3	
K1	2,5	
K2	2,5	
K3	2,5	
K4	2,5	
K5	2,5	
K6	2,5	

Wykresy: stan $x_2=1$ – siły N2



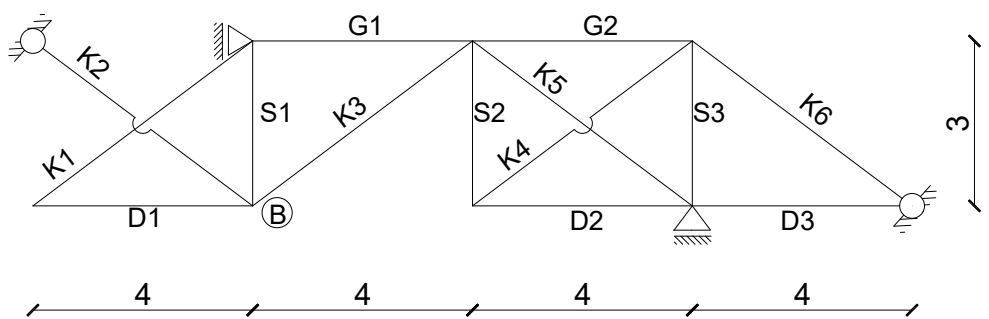
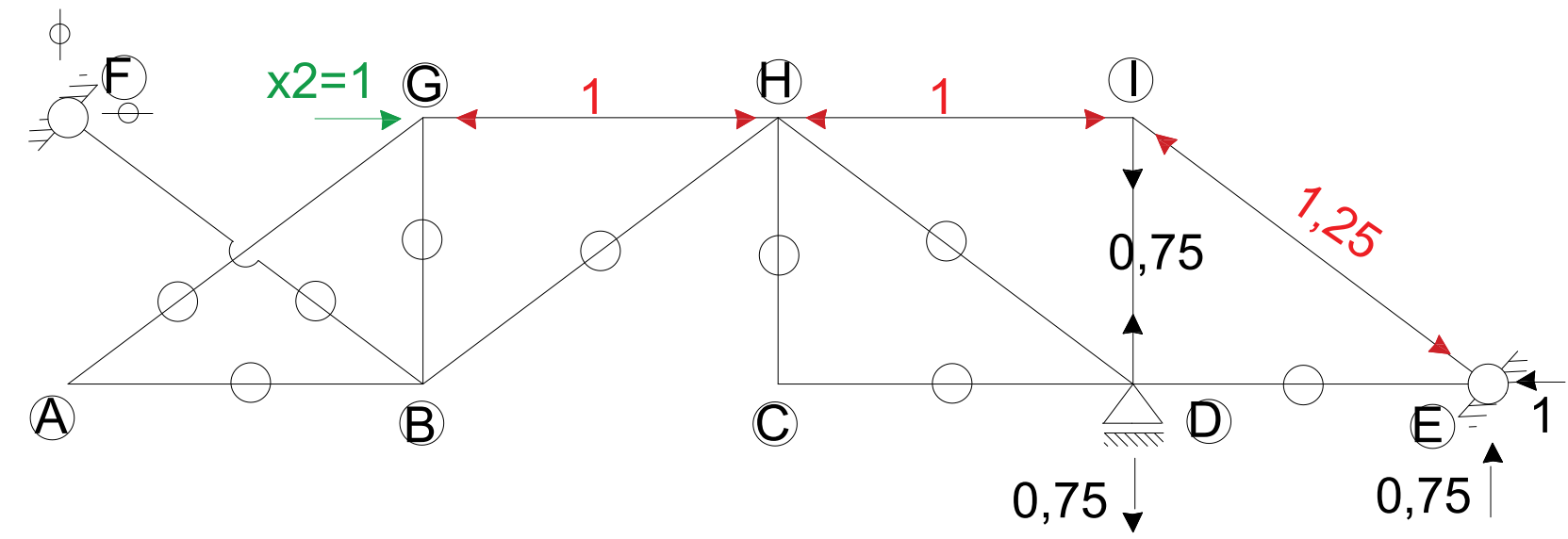
Pręt	L/EA	N2
D1	4	0
D2	4	0
D3	4	0
G1	4	
G2	4	
S1	3	
S2	3	
S3	3	
K1	2,5	
K2	2,5	
K3	2,5	
K4	2,5	
K5	2,5	
K6	2,5	

Wykresy: stan $x_2=1$ – siły N2



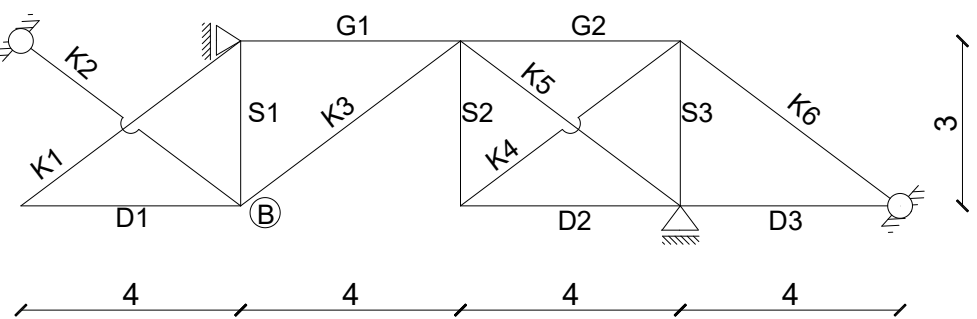
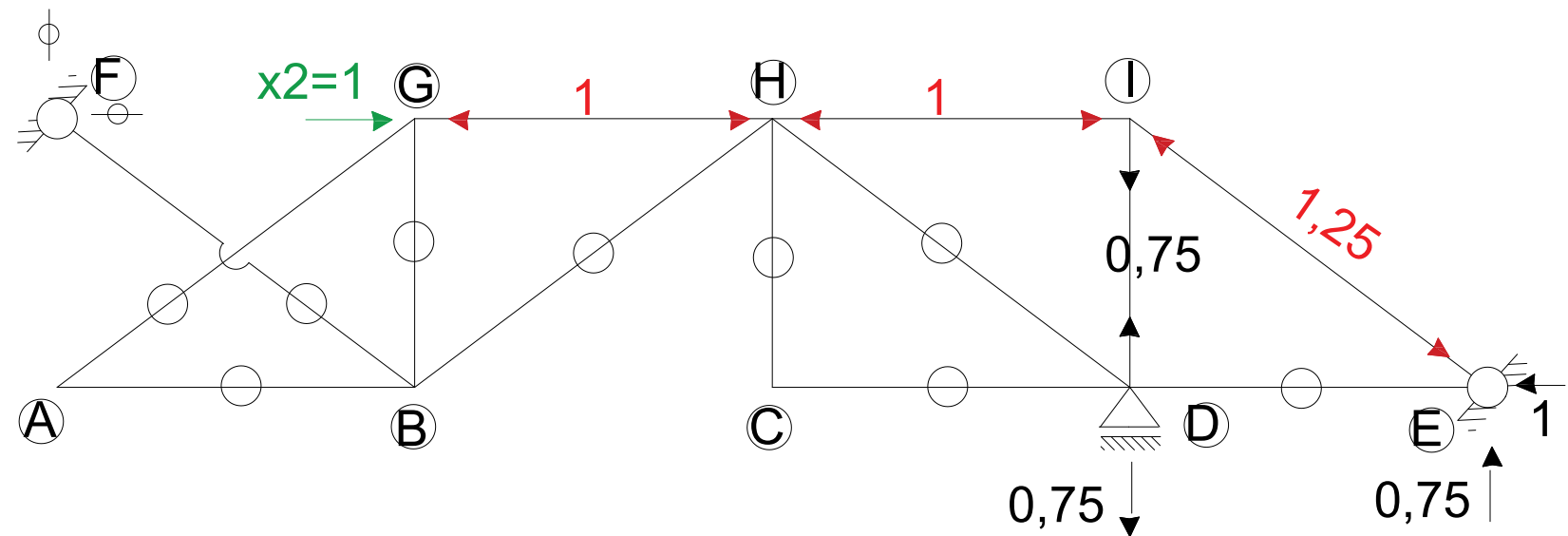
Pręt	L/EA	N2
D1	4	0
D2	4	0
D3	4	0
G1	4	-1
G2	4	-1
S1	3	
S2	3	
S3	3	
K1	2,5	
K2	2,5	
K3	2,5	
K4	2,5	
K5	2,5	
K6	2,5	

Wykresy: stan $x_2=1$ – siły N2



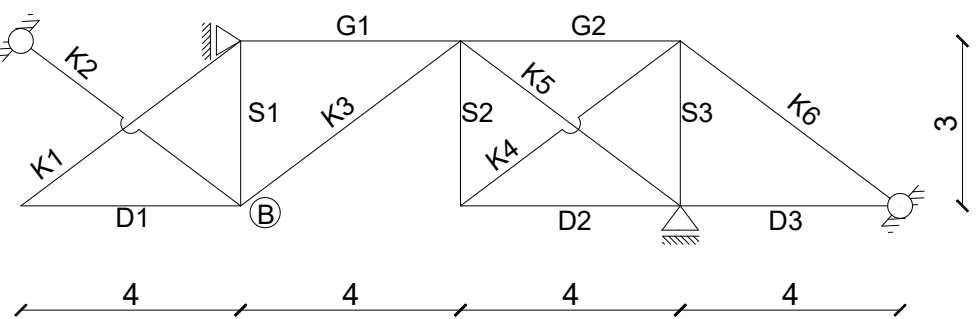
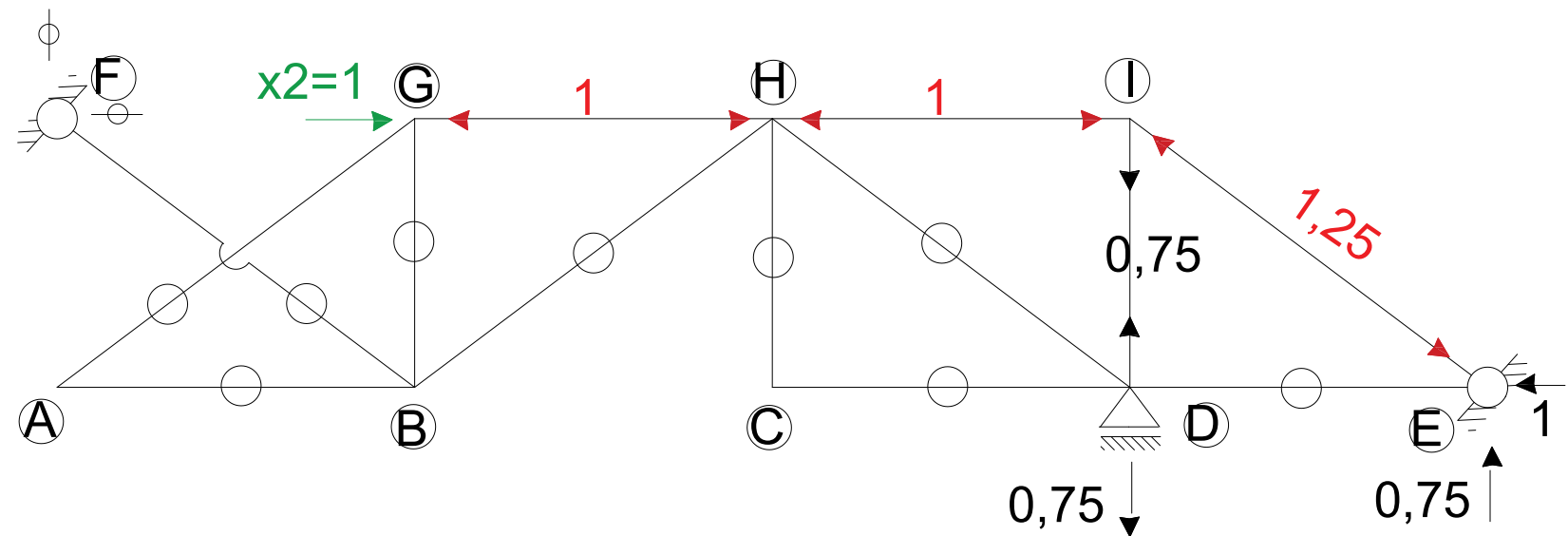
Pręt	L/EA	N2
D1	4	0
D2	4	0
D3	4	0
G1	4	-1
G2	4	-1
S1	3	0
S2	3	0
S3	3	
K1	2,5	
K2	2,5	
K3	2,5	
K4	2,5	
K5	2,5	
K6	2,5	

Wykresy: stan $x_2=1$ – siły N2



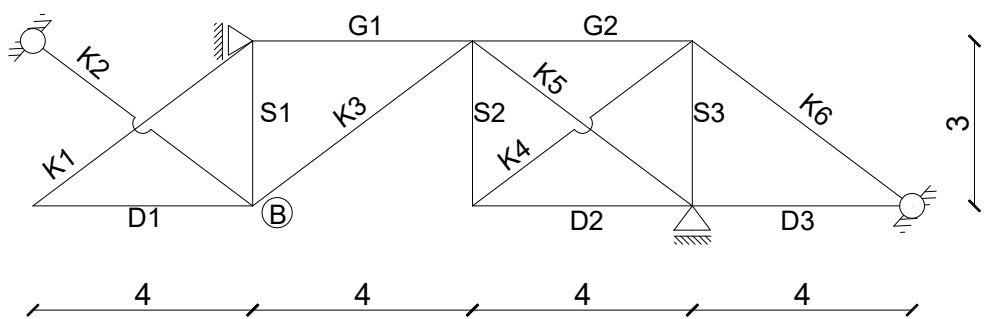
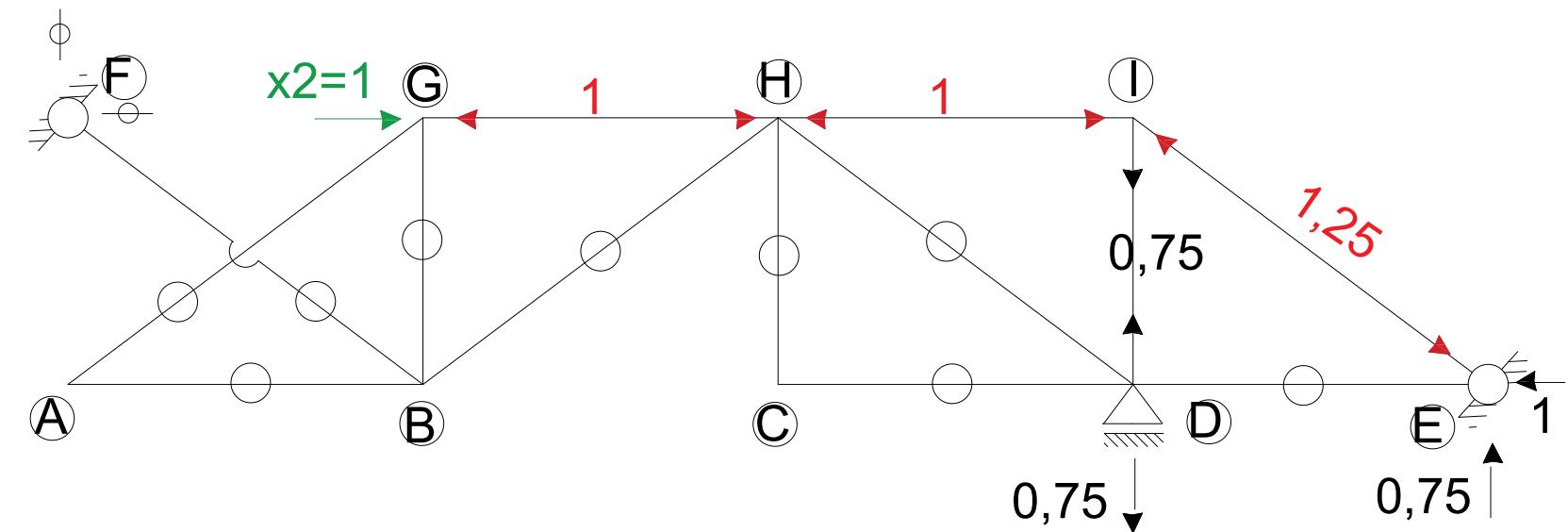
Pręt	L/EA	N2
D1	4	0
D2	4	0
D3	4	0
G1	4	-1
G2	4	-1
S1	3	0
S2	3	0
S3	3	0,75
K1	2,5	
K2	2,5	
K3	2,5	
K4	2,5	
K5	2,5	
K6	2,5	

Wykresy: stan $x_2=1$ – siły N2



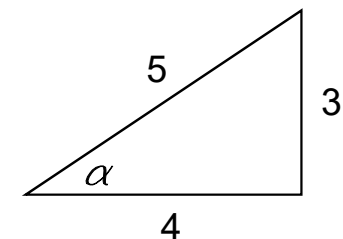
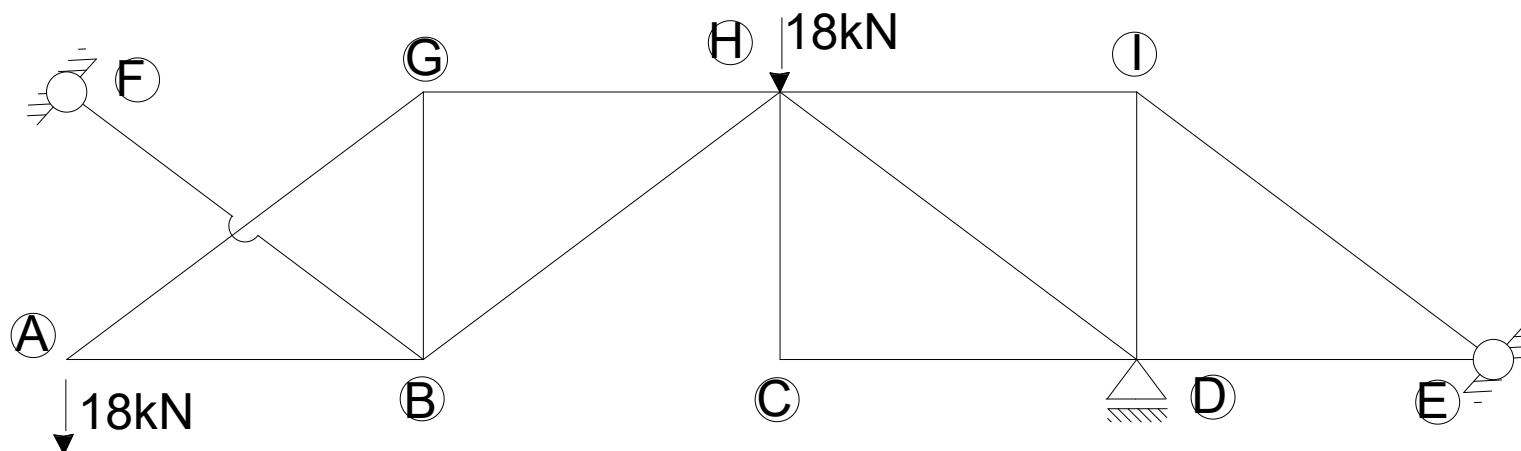
Pręt	L/EA	N2
D1	4	0
D2	4	0
D3	4	0
G1	4	-1
G2	4	-1
S1	3	0
S2	3	0
S3	3	0,75
K1	2,5	0
K2	2,5	0
K3	2,5	0
K4	2,5	0
K5	2,5	0
K6	2,5	

Wykresy: stan $x_2=1$ – siły N2



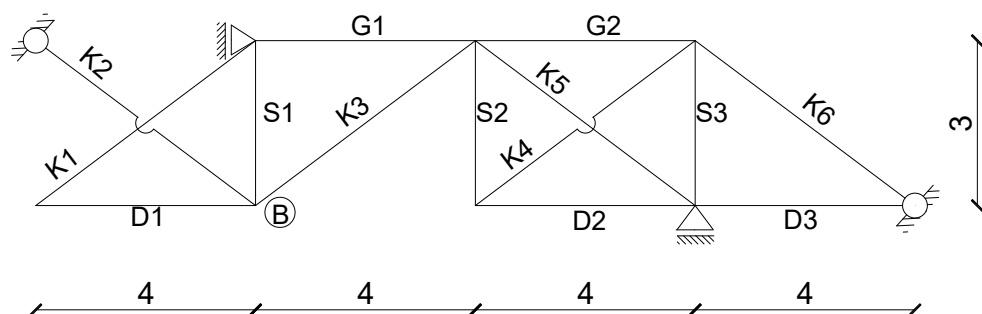
Pręt	L/EA	N2
D1	4	0
D2	4	0
D3	4	0
G1	4	-1
G2	4	-1
S1	3	0
S2	3	0
S3	3	0,75
K1	2,5	0
K2	2,5	0
K3	2,5	0
K4	2,5	0
K5	2,5	0
K6	2,5	-1,25

Wykresy: obciążenie zewnętrzne – siły N0 [kN]

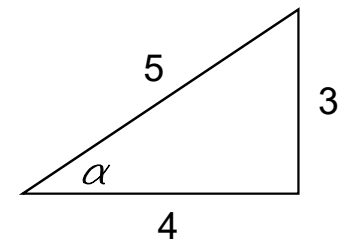
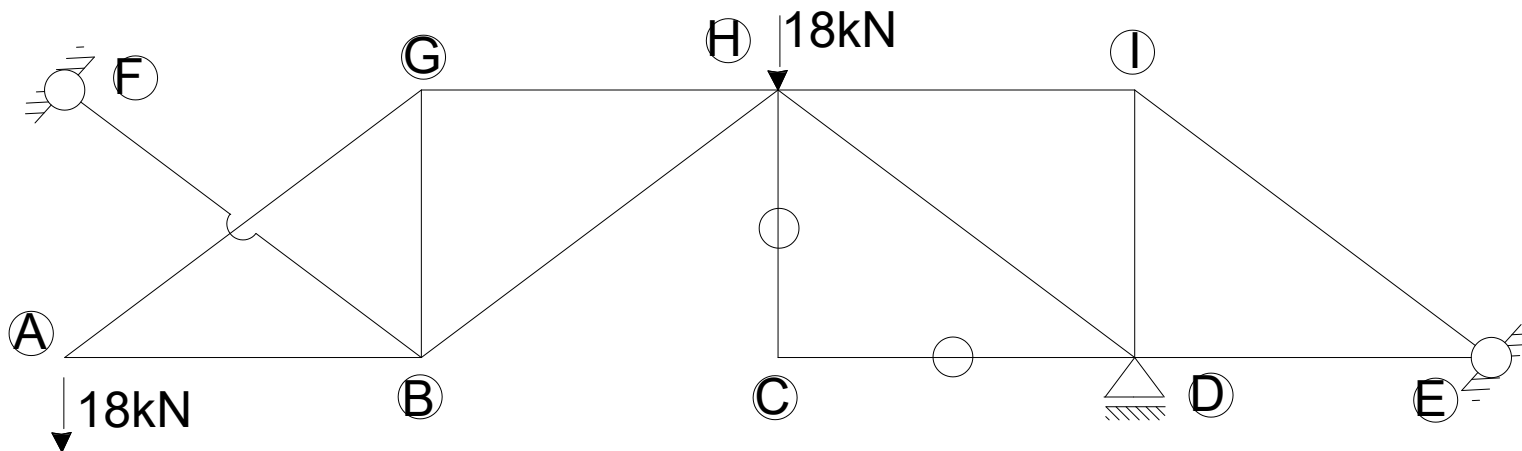


$$\cos \alpha = \frac{4}{5} = 0,8$$

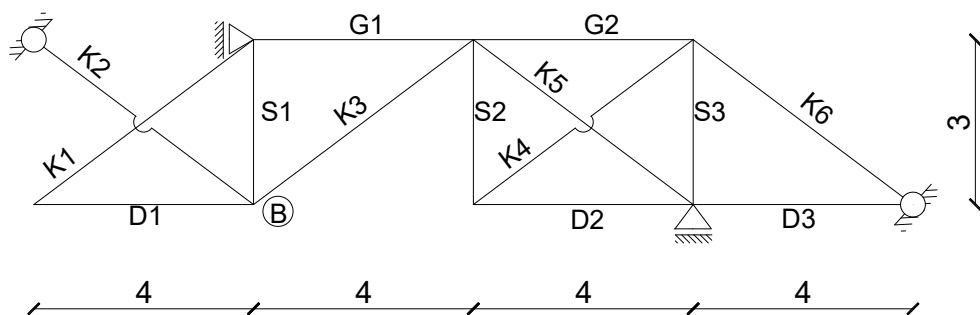
$$\sin \alpha = \frac{3}{5} = 0,6$$



Wykresy: obciążenie zewnętrzne – siły N0 [kN]

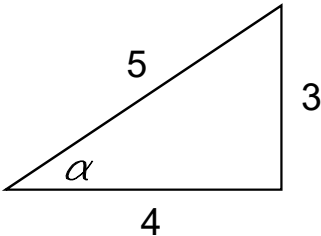
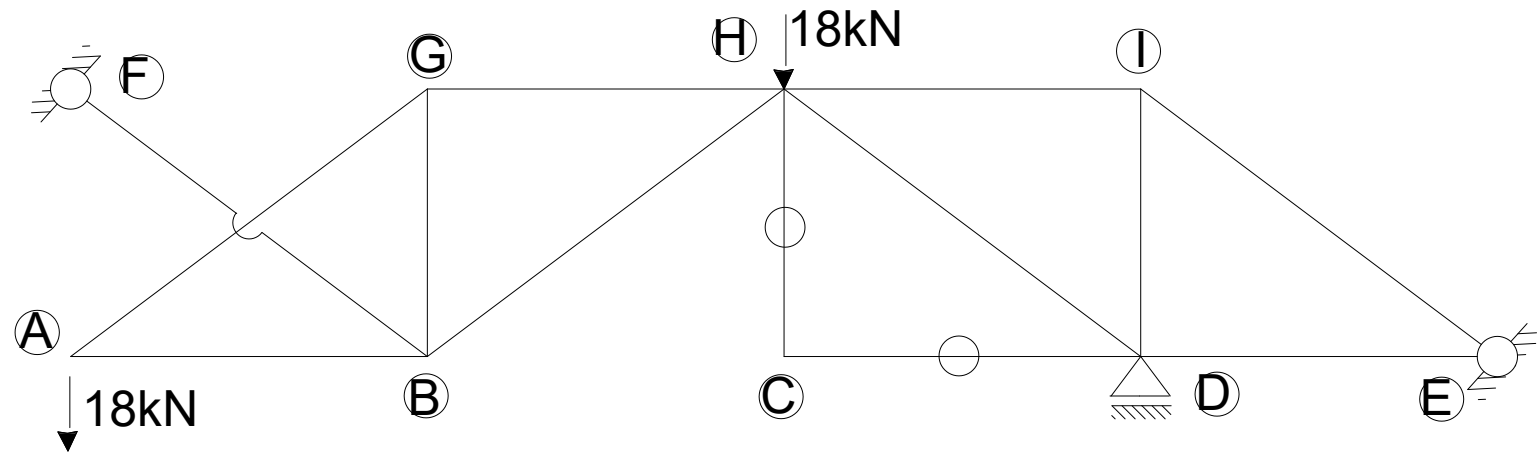


$$\begin{aligned}\cos\alpha &= \frac{4}{5} = 0,8 \\ \sin\alpha &= \frac{3}{5} = 0,6\end{aligned}$$



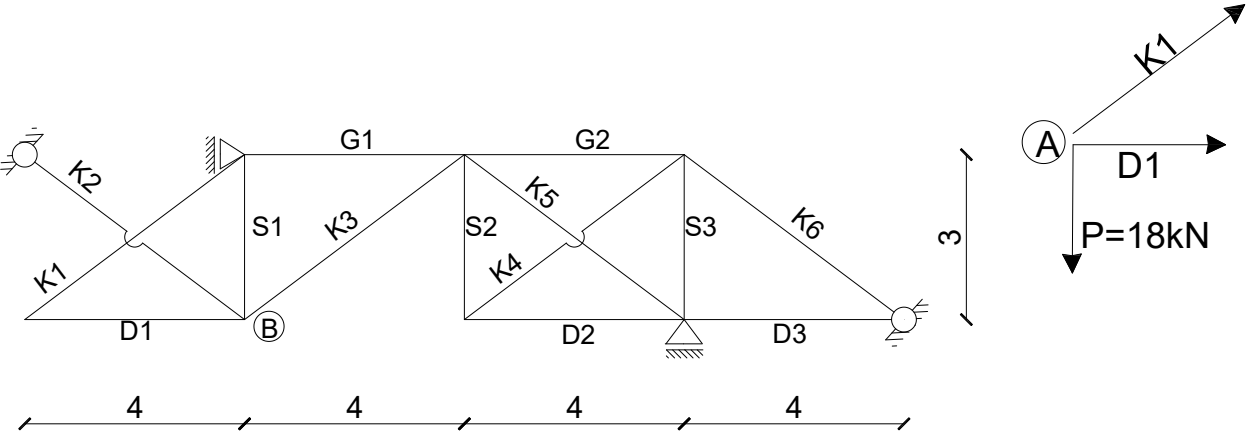
dr inż. Hanna Weber

Wykresy: obciążenie zewnętrzne – siły N0 [kN]

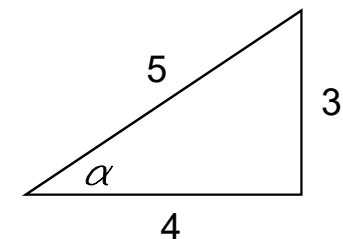
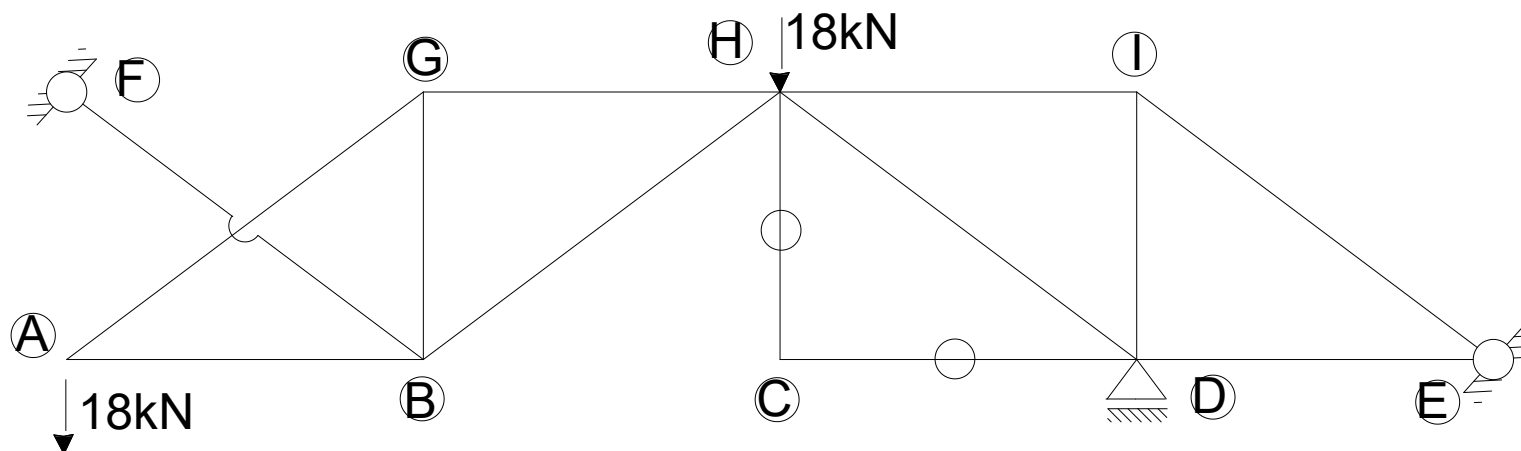


$$\cos\alpha = \frac{4}{5} = 0,8$$

$$\sin\alpha = \frac{3}{5} = 0,6$$

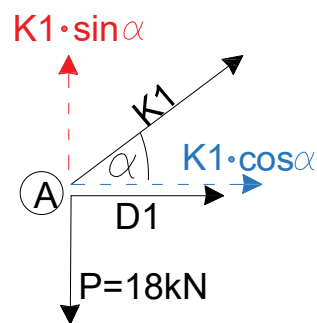
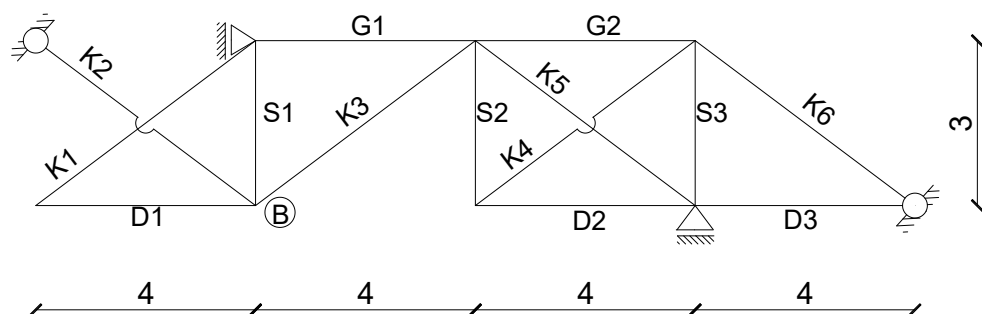


Wykresy: obciążenie zewnętrzne – siły N0 [kN]

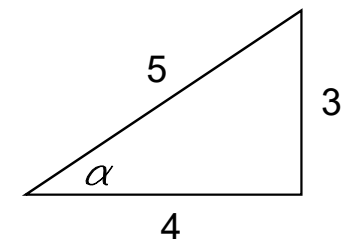
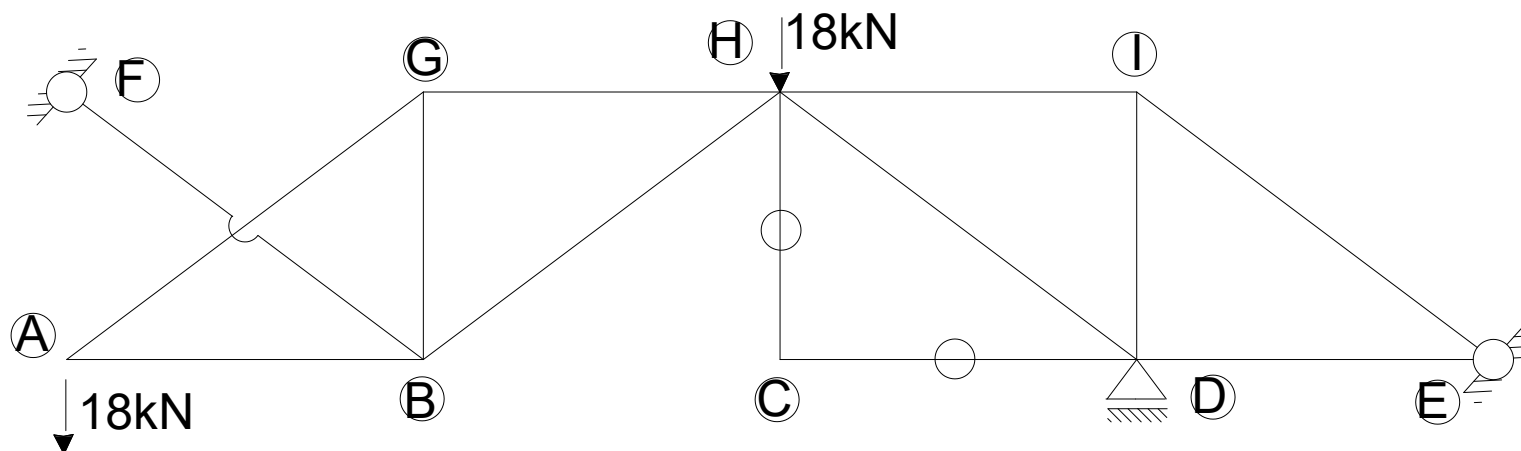


$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$



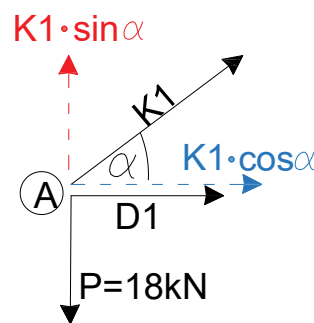
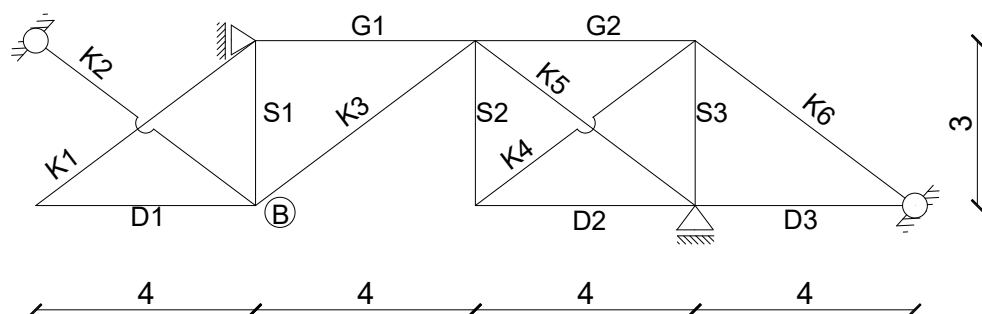
Wykresy: obciążenie zewnętrzne – siły N0 [kN]



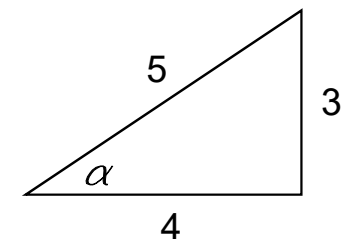
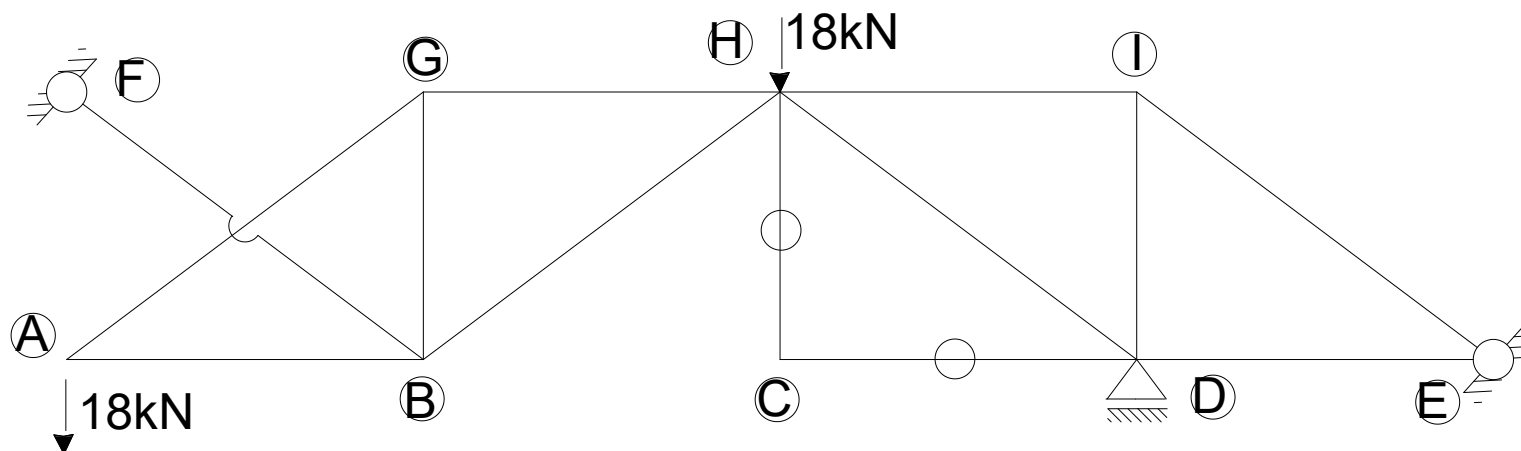
$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$

$$\sum R_Y = -18 + K1 \cdot \sin \alpha = 0$$



Wykresy: obciążenie zewnętrzne – siły N0 [kN]

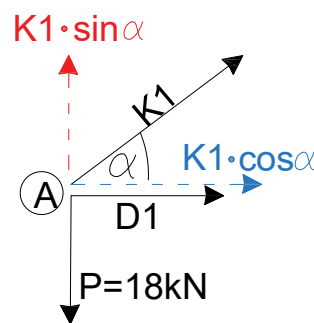
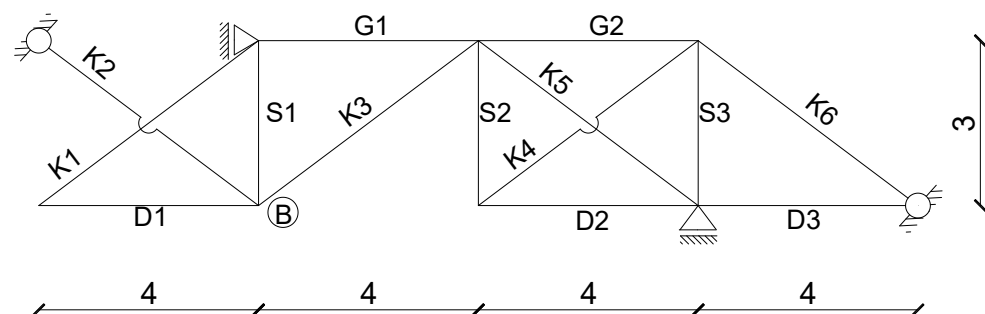


$$\cos \alpha = \frac{4}{5} = 0,8$$

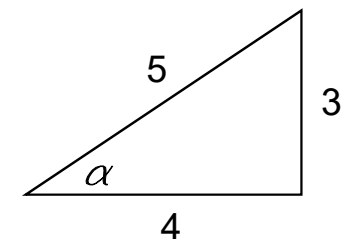
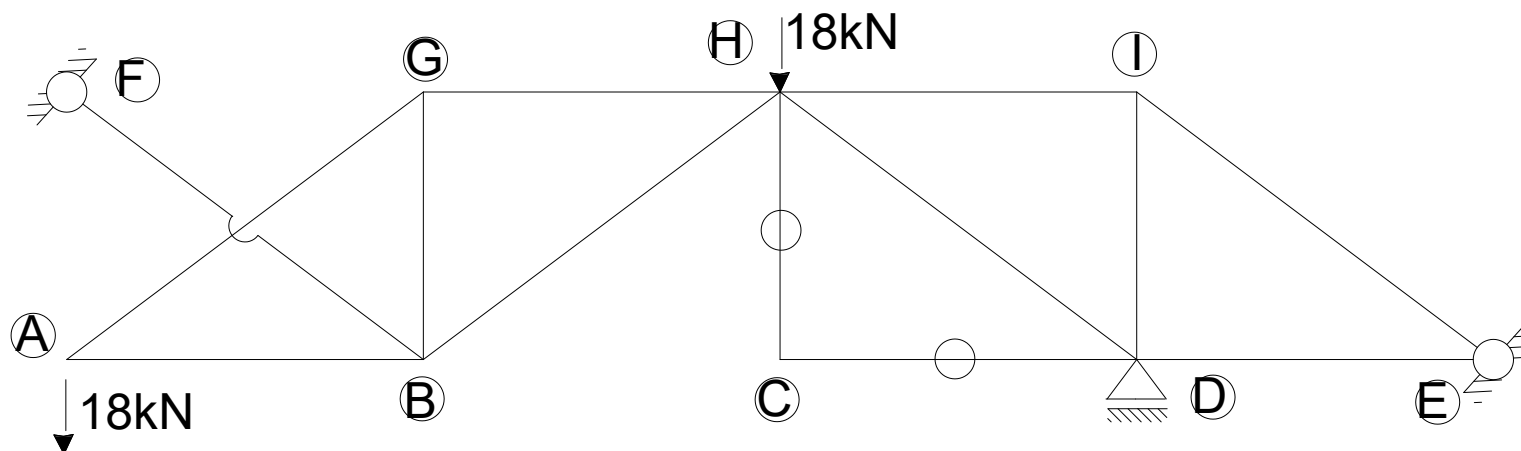
$$\sin \alpha = \frac{3}{5} = 0,6$$

$$\sum R_Y = -18 + K1 \cdot \sin \alpha = 0$$

↓

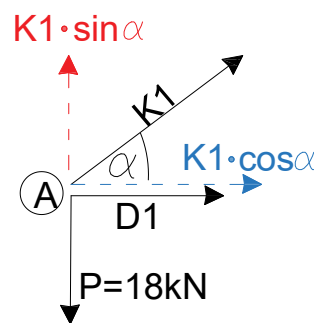
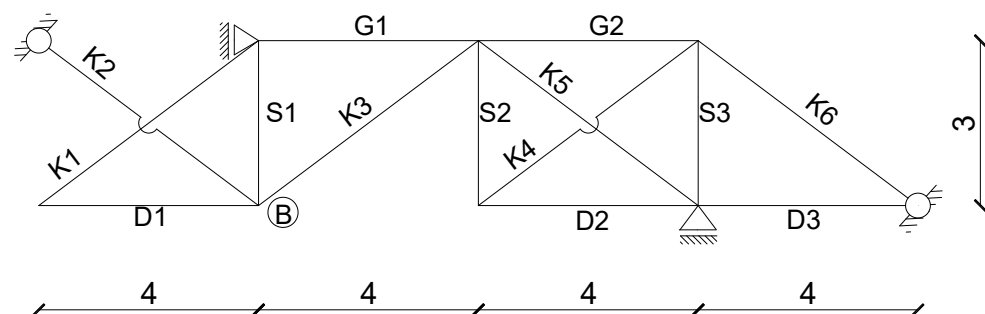


Wykresy: obciążenie zewnętrzne – siły N0 [kN]



$$\cos \alpha = \frac{4}{5} = 0,8$$

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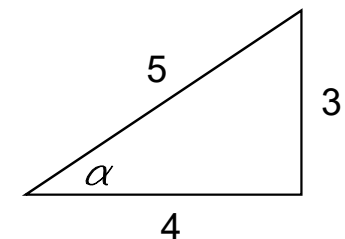
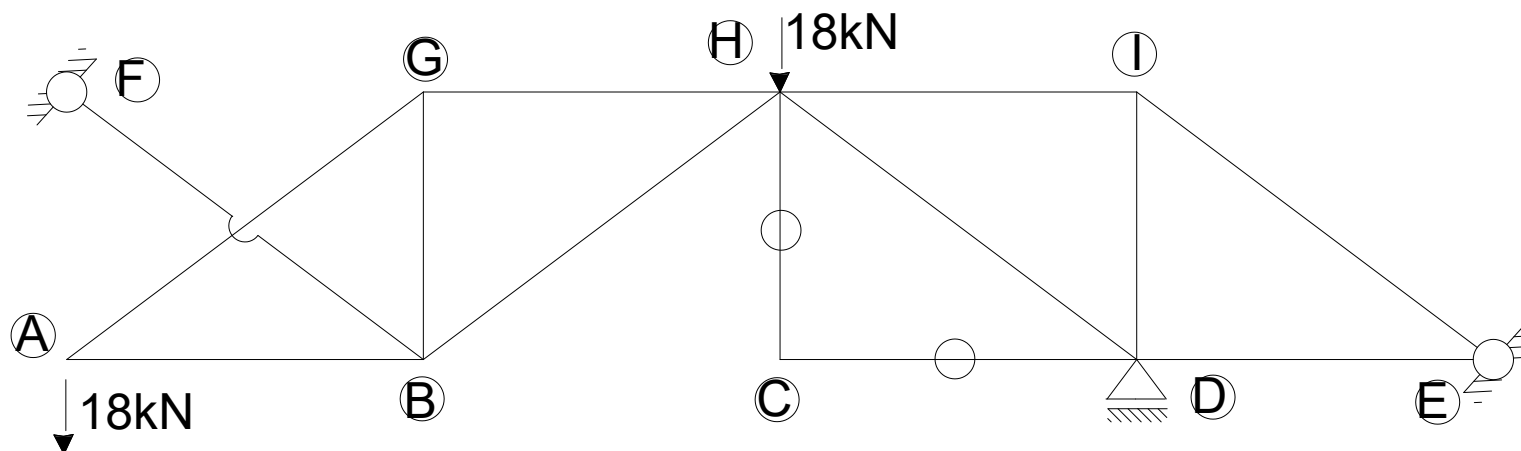


$$\sum R_Y = -18 + K1 \cdot \sin \alpha = 0$$



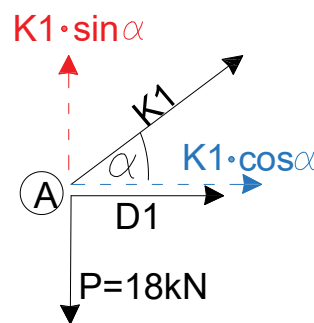
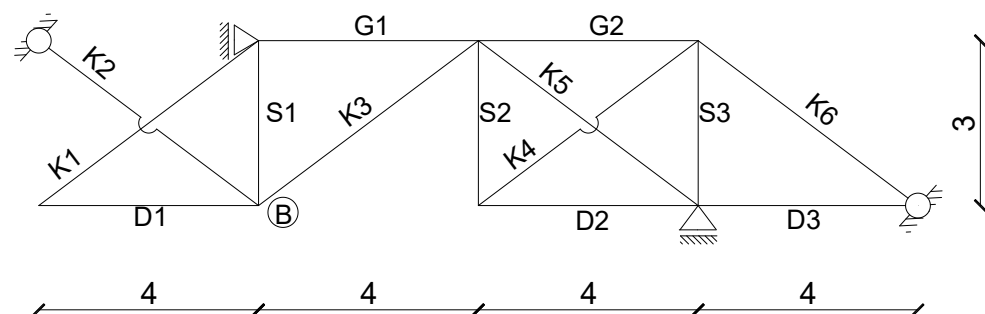
$$K1 = \frac{18}{\sin \alpha} = 18 \cdot \frac{5}{3} = 30 \text{ kN}$$

Wykresy: obciążenie zewnętrzne – siły N0 [kN]



$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$



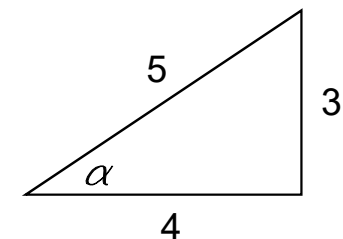
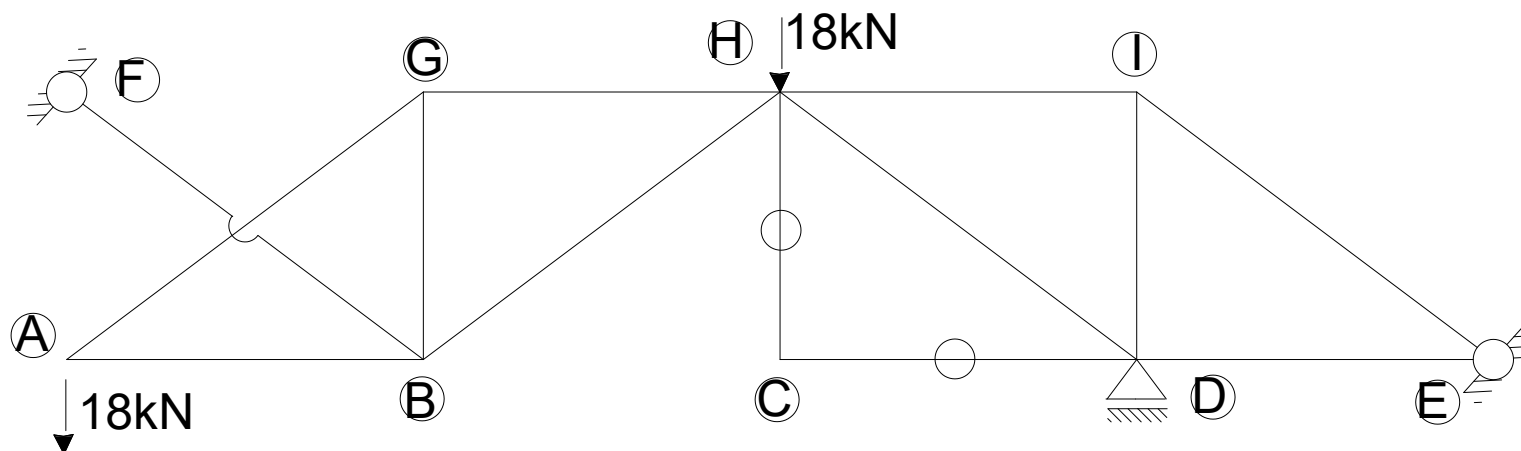
$$\sum R_Y = -18 + K1 \cdot \sin \alpha = 0$$



$$K1 = \frac{18}{\sin \alpha} = 18 \cdot \frac{5}{3} = 30 \text{ kN}$$

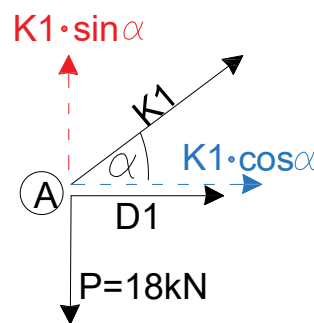
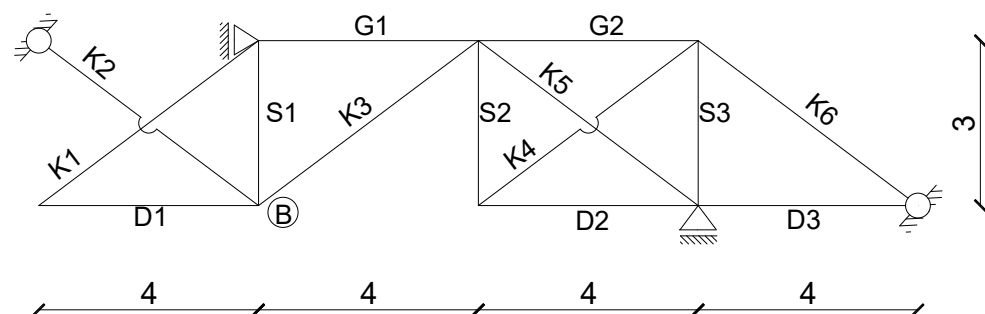
$$\sum R_X = D1 + K1 \cdot \cos \alpha = 0$$

Wykresy: obciążenie zewnętrzne – siły N0 [kN]



$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$



$$\sum R_Y = -18 + K1 \cdot \sin \alpha = 0$$

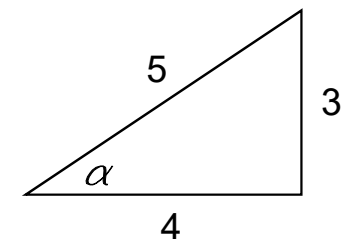
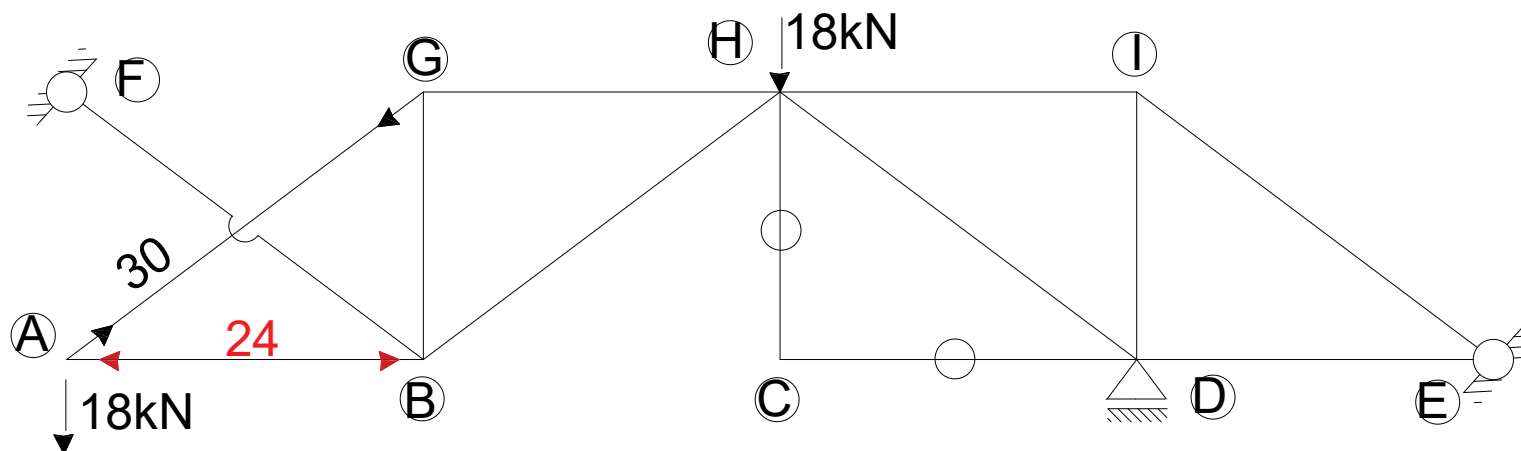


$$K1 = \frac{18}{\sin \alpha} = 18 \cdot \frac{5}{3} = 30 \text{ kN}$$

$$\sum R_X = D1 + K1 \cdot \cos \alpha = 0$$

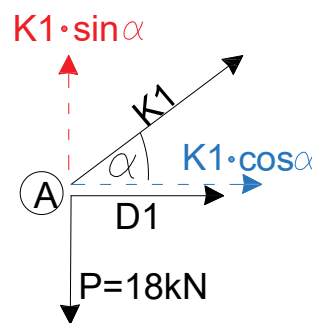
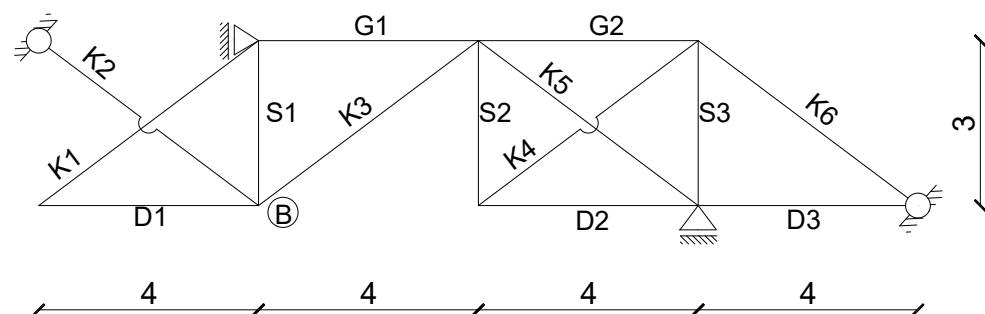
$$D1 = -K1 \cdot \cos \alpha = -30 \cdot \frac{4}{5} = -24 \text{ kN}$$

Wykresy: obciążenie zewnętrzne – siły N0 [kN]



$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$



$$\sum R_Y = -18 + K1 \cdot \sin \alpha = 0$$

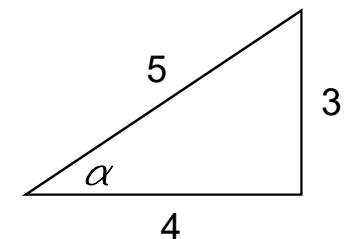
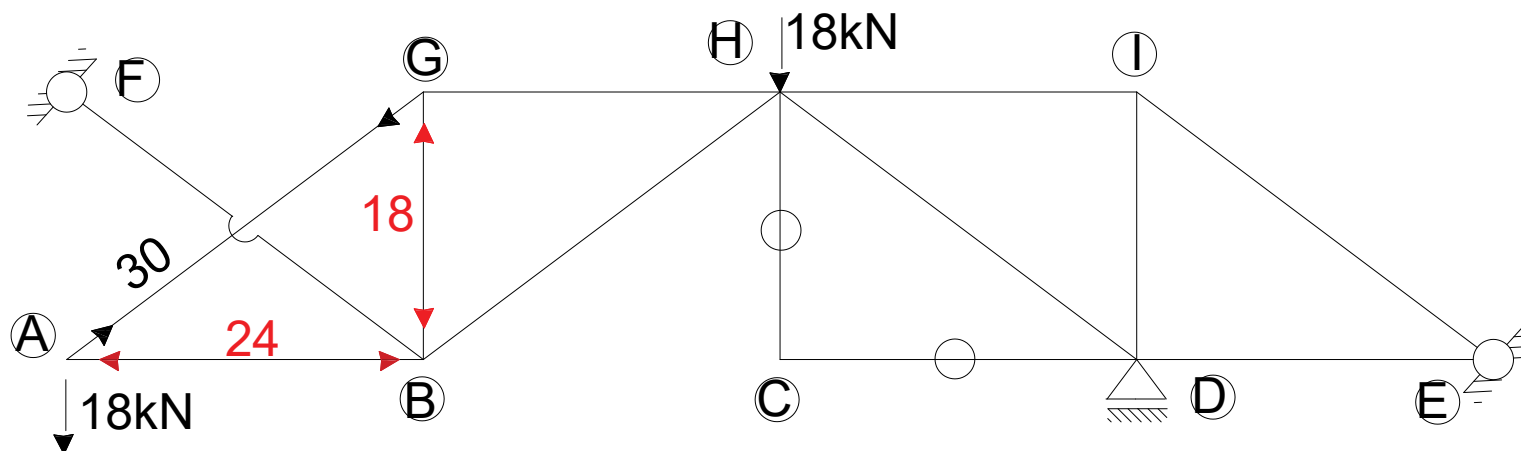


$$K1 = \frac{18}{\sin \alpha} = 18 \cdot \frac{5}{3} = 30 \text{ kN}$$

$$\sum R_X = D1 + K1 \cdot \cos \alpha = 0$$

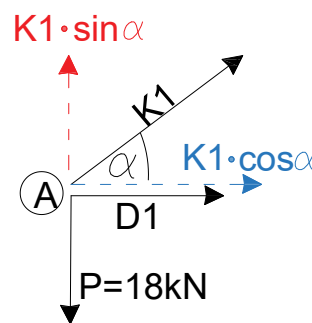
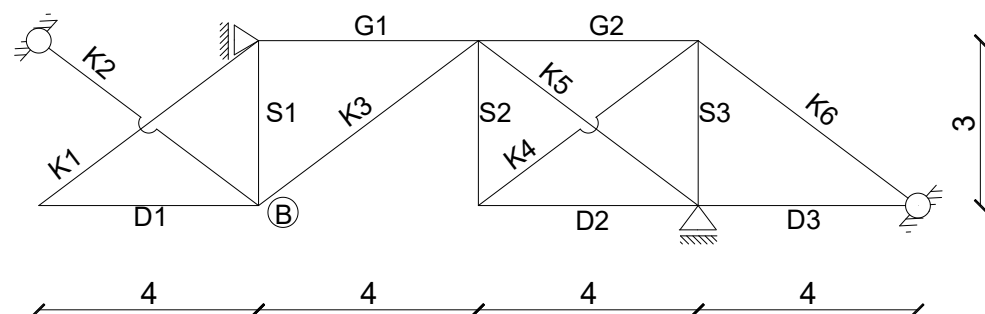
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Wykresy: obciążenie zewnętrzne – siły N0 [kN]



$$\cos \alpha = \frac{4}{5} = 0,8$$

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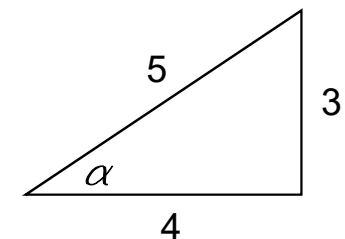
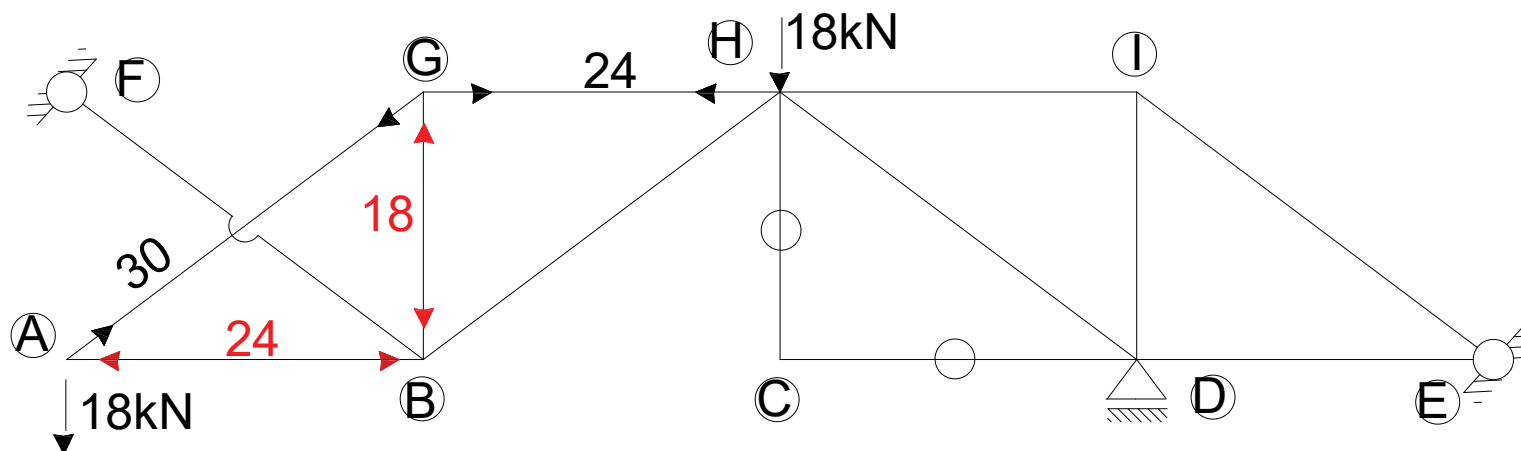


$$K1 = \frac{18}{\sin \alpha} = 18 \cdot \frac{5}{3} = 30 \text{ kN}$$

$$\sum R_X = D1 + K1 \cdot \cos \alpha = 0$$

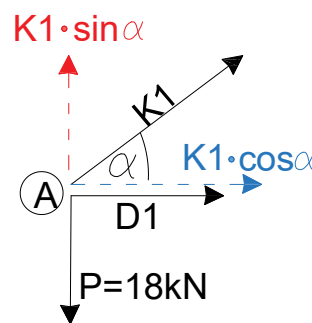
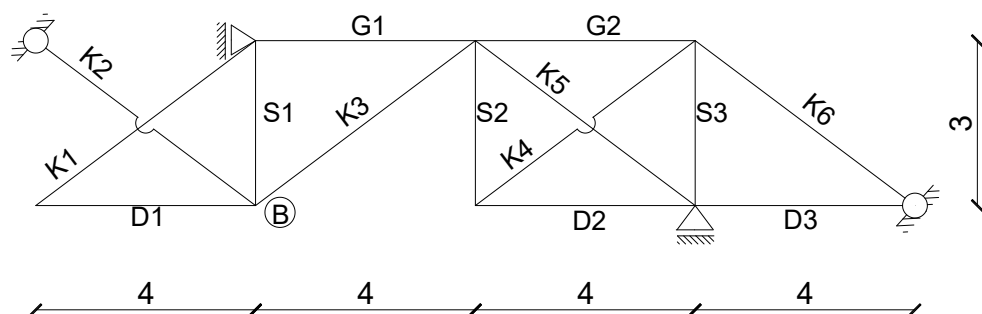
$$D1 = -K1 \cdot \cos \alpha = -30 \cdot \frac{4}{5} = -24 \text{ kN}$$

Wykresy: obciążenie zewnętrzne – siły N0 [kN]



$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$



$$\sum R_Y = -18 + K1 \cdot \sin \alpha = 0$$

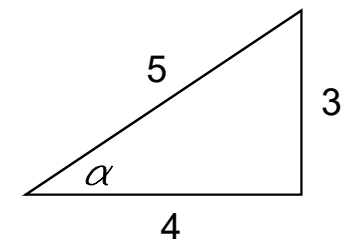
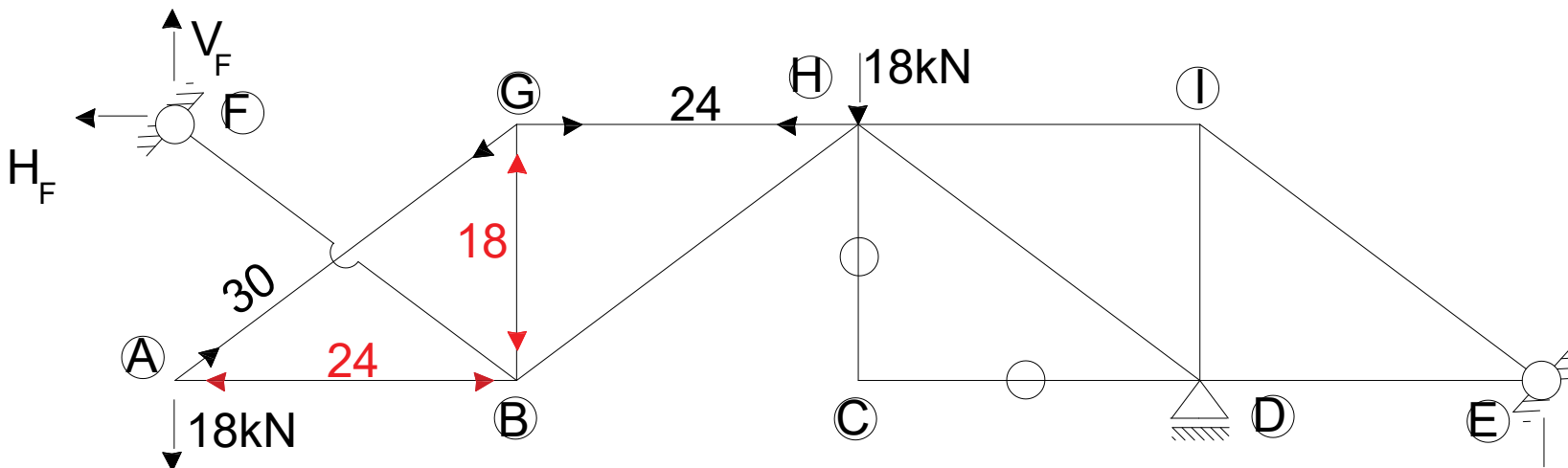


$$K1 = \frac{18}{\sin \alpha} = 18 \cdot \frac{5}{3} = 30 \text{ kN}$$

$$\sum R_X = D1 + K1 \cdot \cos \alpha = 0$$

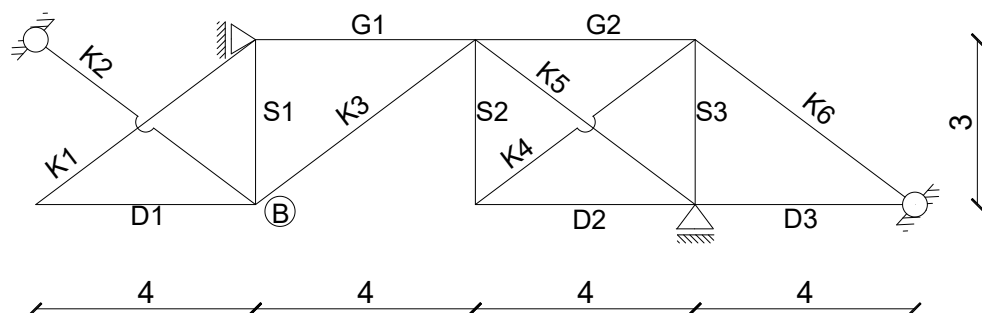
$$D1 = -K1 \cdot \cos \alpha = -30 \cdot \frac{4}{5} = -24 \text{ kN}$$

Wykresy: obciążenie zewnętrzne – siły N0 [kN]

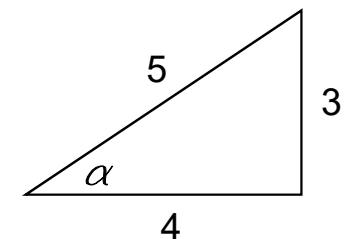
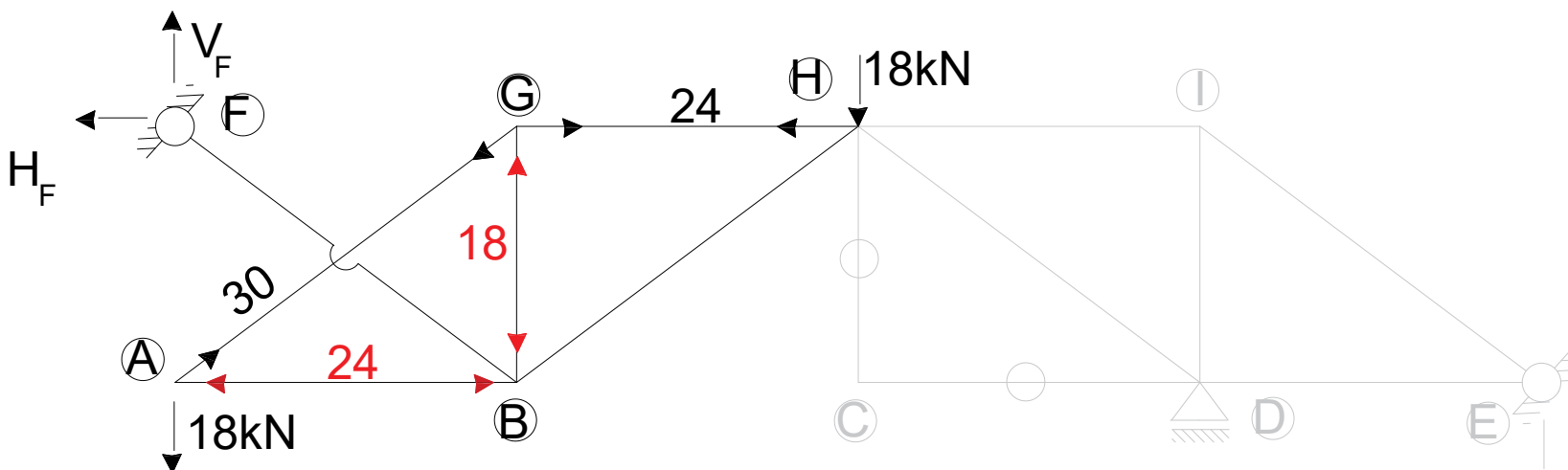


$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$

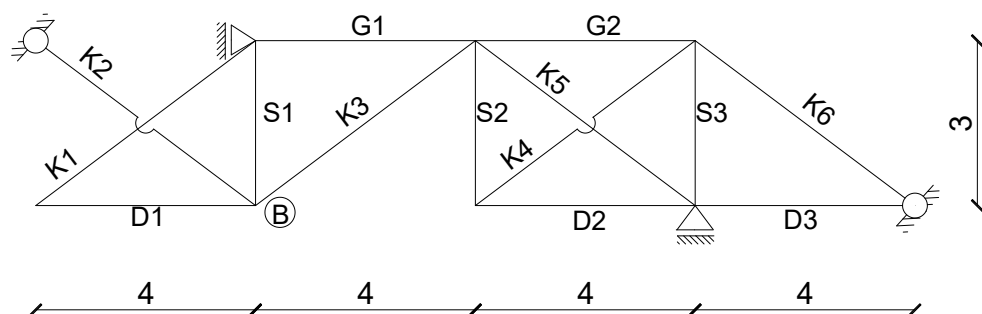


Wykresy: obciążenie zewnętrzne – siły N0 [kN]

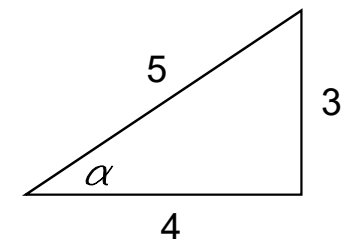
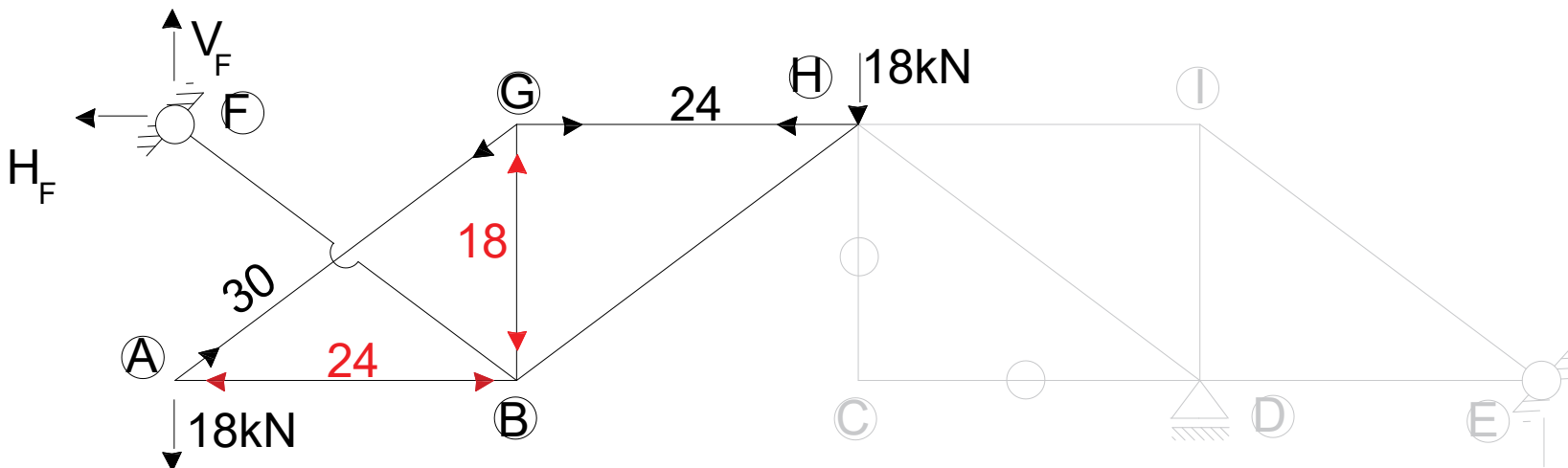


$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$

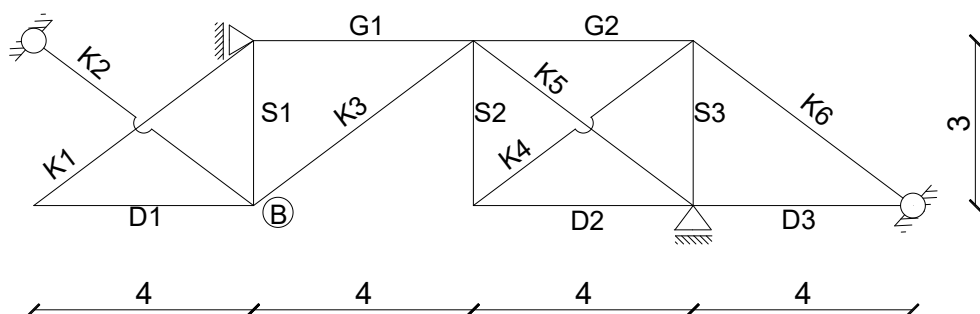


Wykresy: obciążenie zewnętrzne – siły N0 [kN]



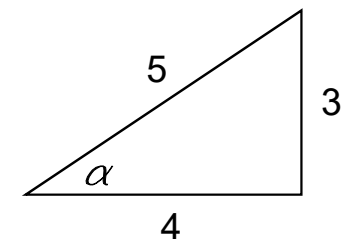
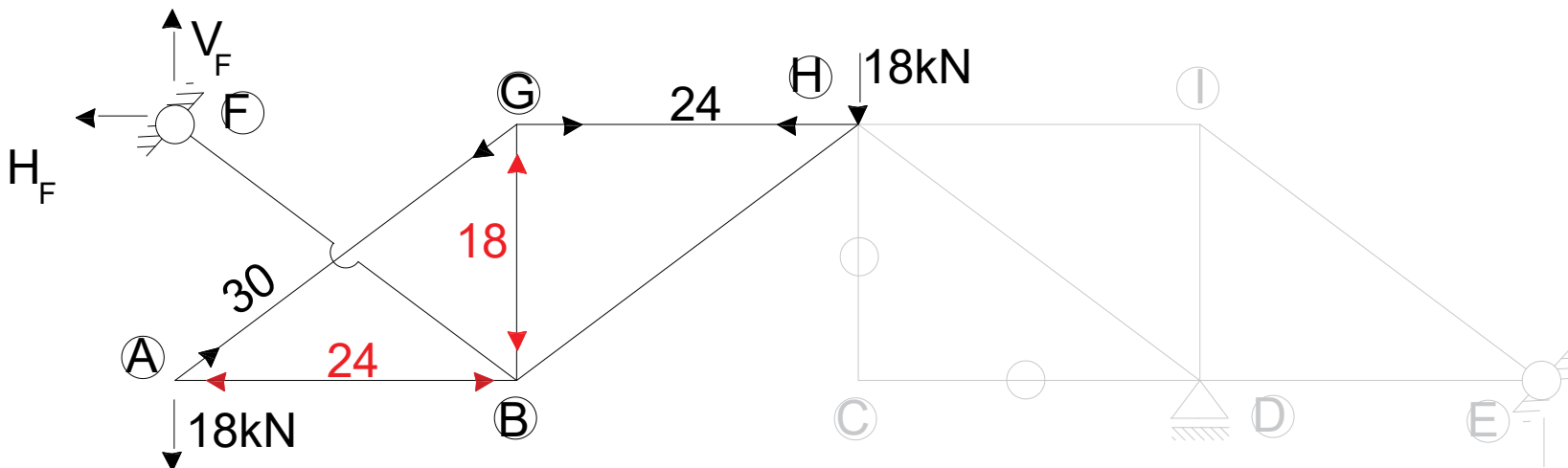
$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$



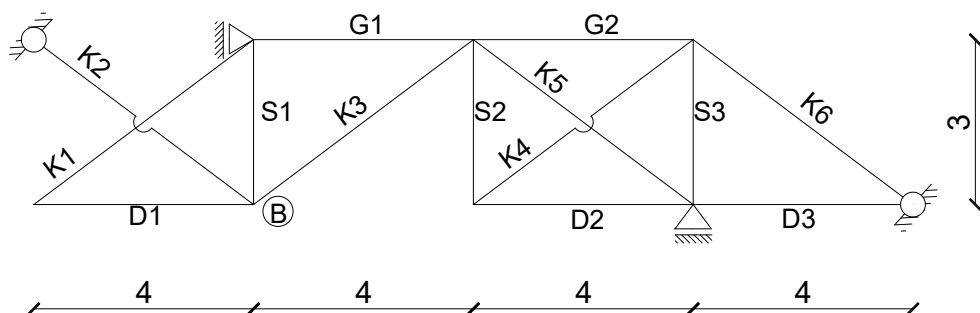
$$\sum M_H^L = -18 \cdot 8 + V_F \cdot 8 = 0$$

Wykresy: obciążenie zewnętrzne – siły N0 [kN]



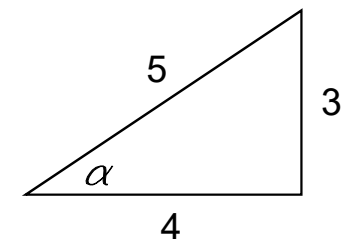
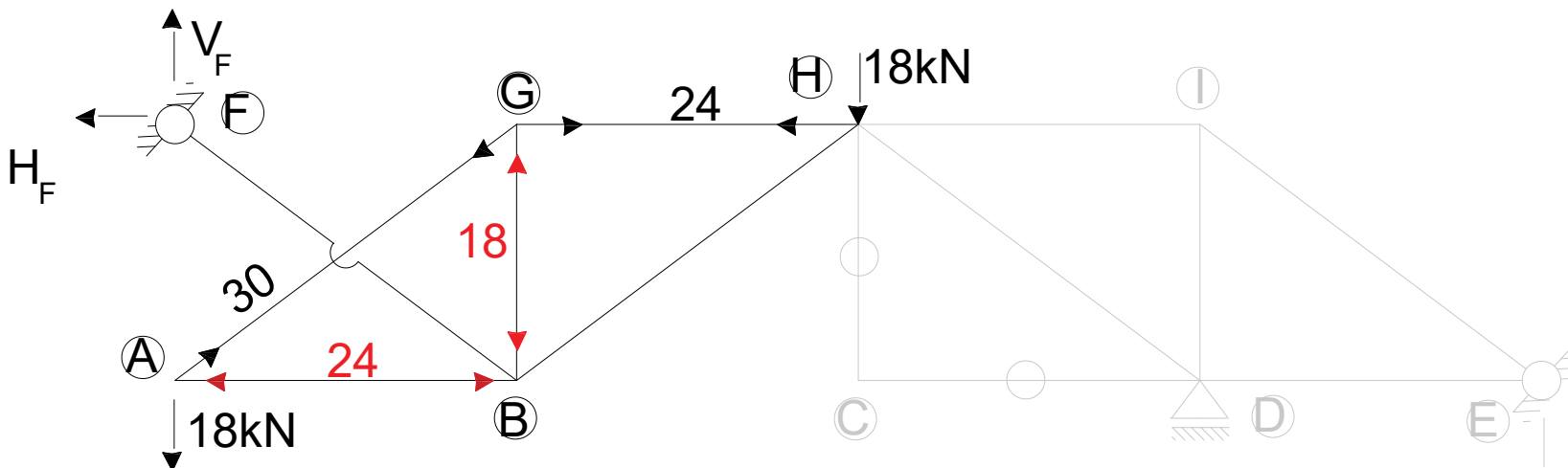
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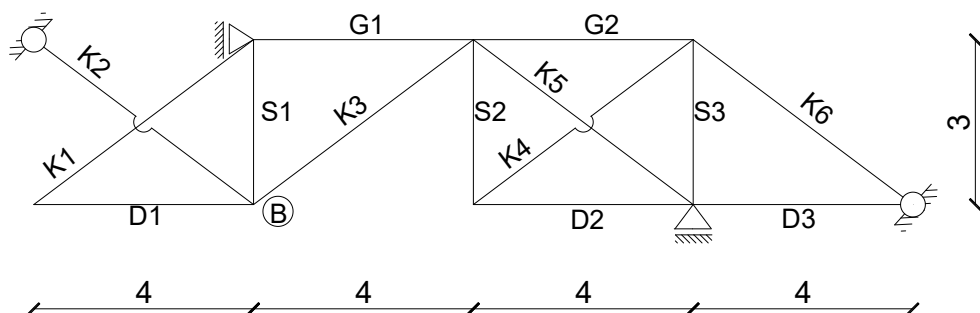
$$\sum M_H^L = -18 \cdot 8 + V_F \cdot 8 = 0 \rightarrow$$

Wykresy: obciążenie zewnętrzne – siły N0 [kN]



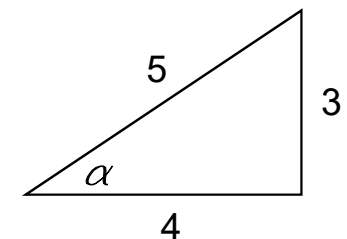
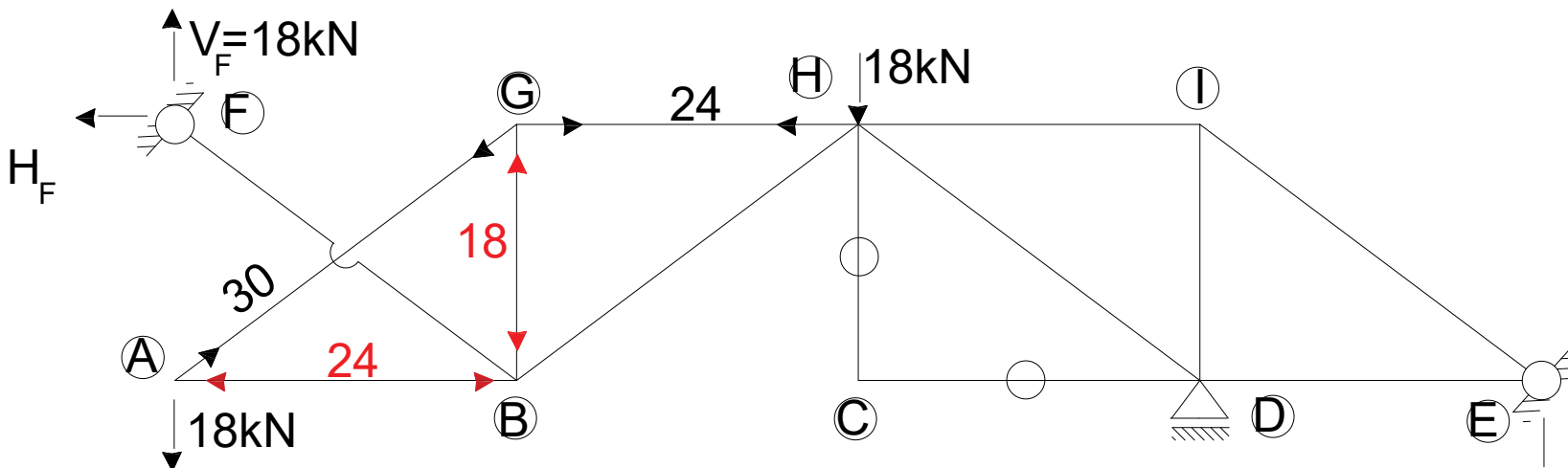
$$\cos \alpha = \frac{4}{5} = 0,8$$

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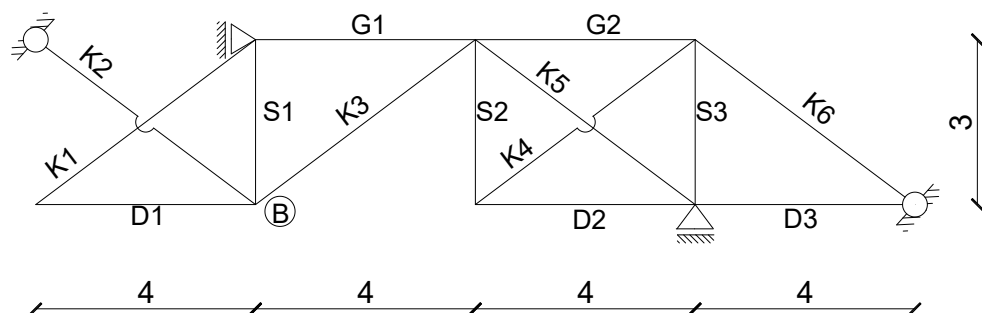
$$\sum M_H^L = -18 \cdot 8 + V_F \cdot 8 = 0 \rightarrow V_F = 18 \text{ kN}$$

Wykresy: obciążenie zewnętrzne – siły N0 [kN]



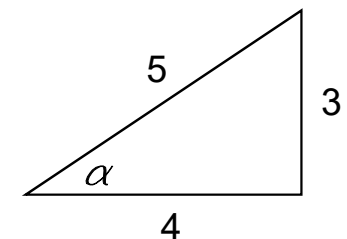
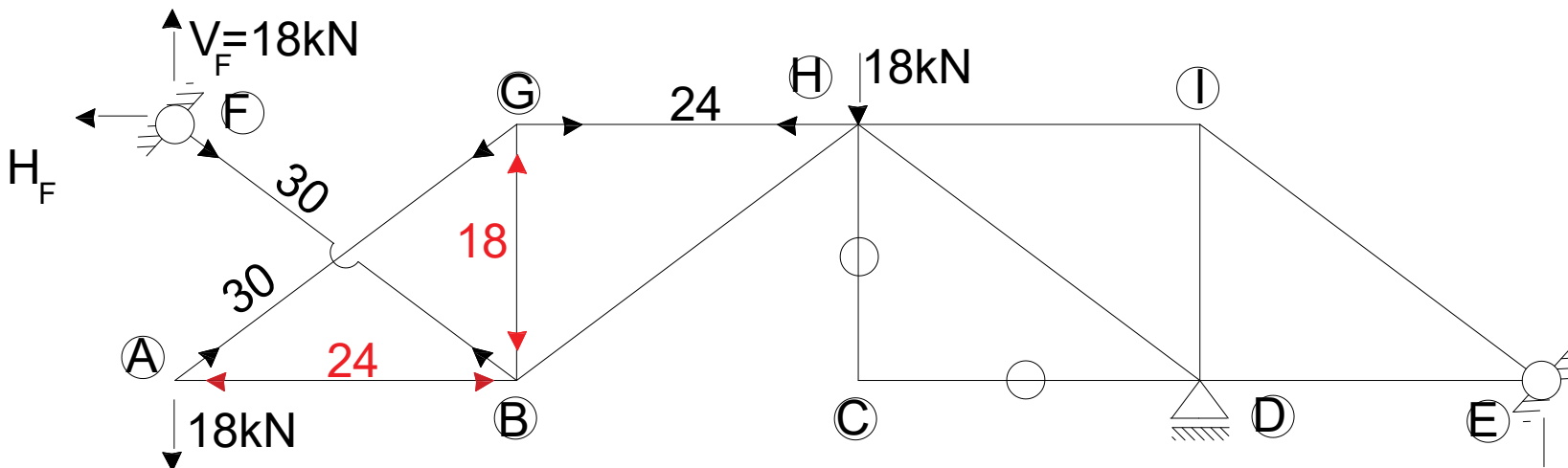
$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$



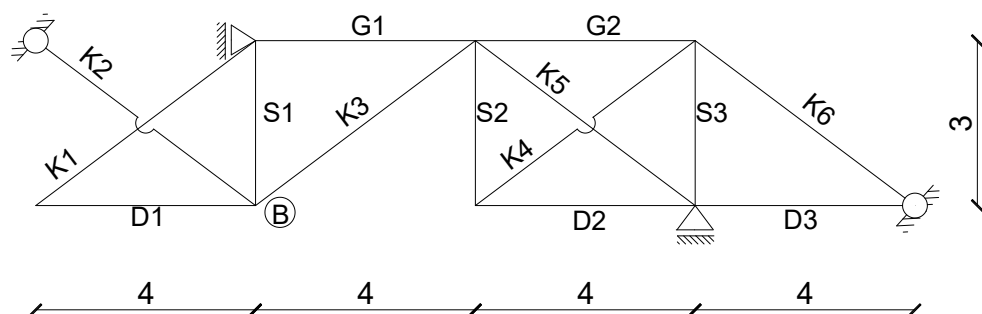
$$\sum M_H^L = -18 \cdot 8 + V_F \cdot 8 = 0 \rightarrow V_F = 18 \text{ kN}$$

Wykresy: obciążenie zewnętrzne – siły N0 [kN]



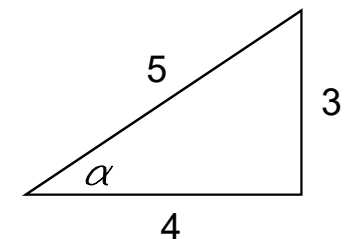
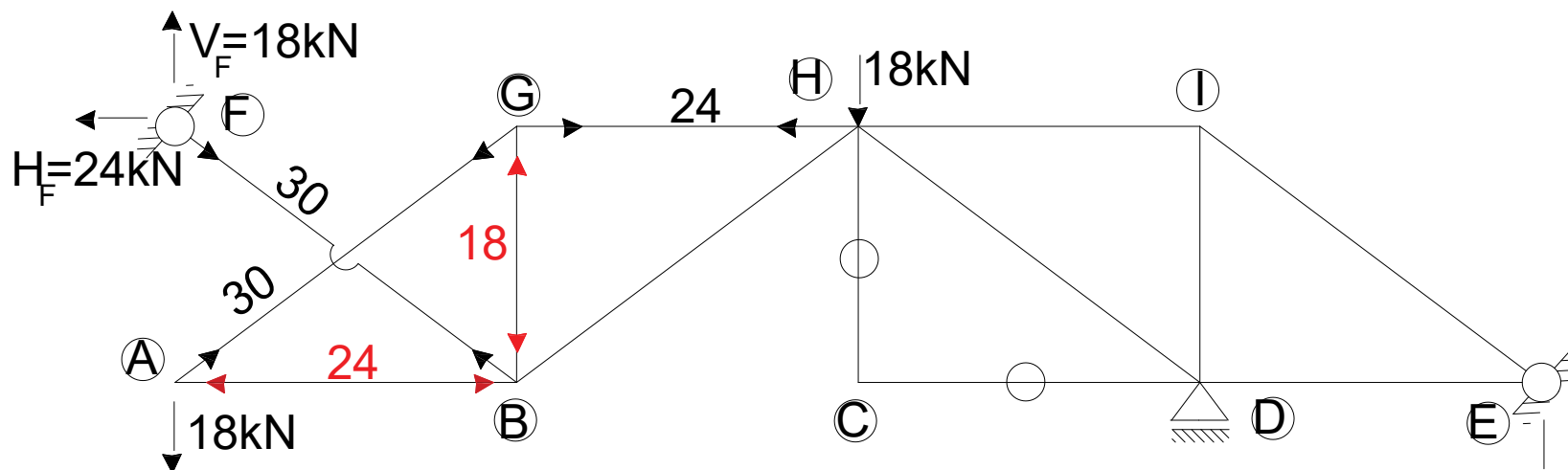
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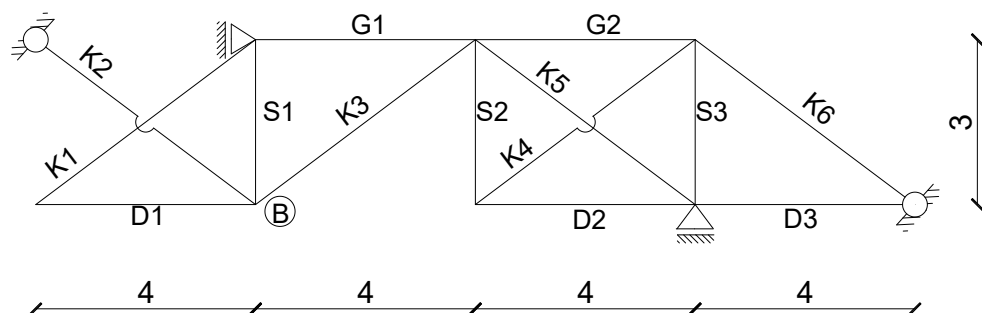
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Wykresy: obciążenie zewnętrzne – siły N0 [kN]



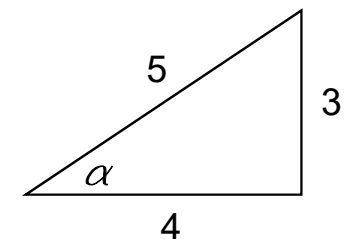
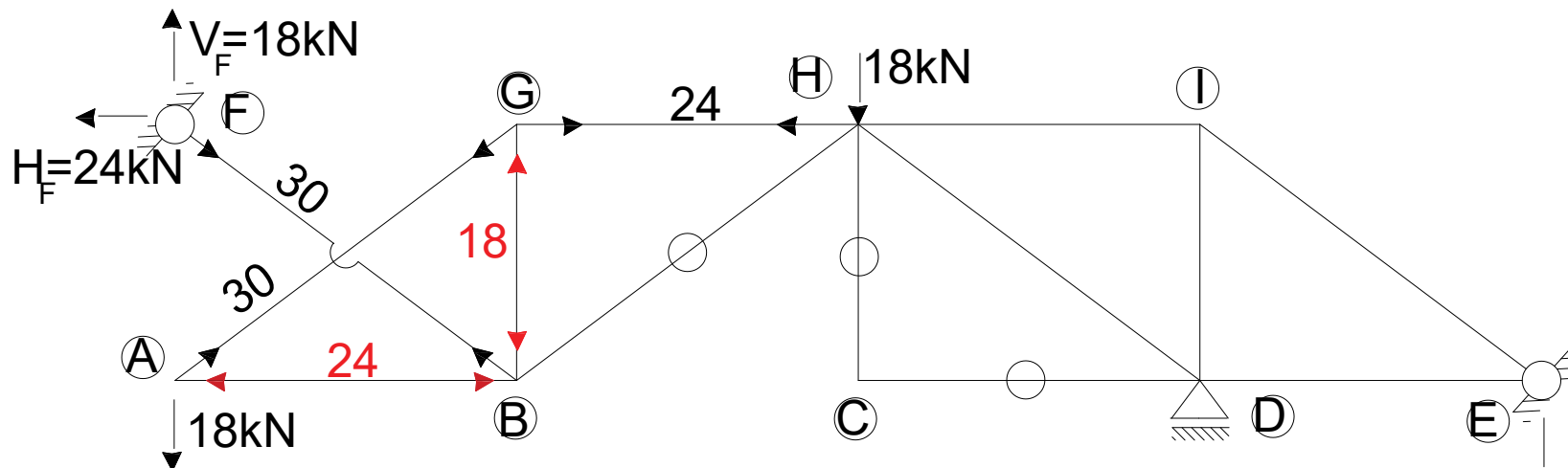
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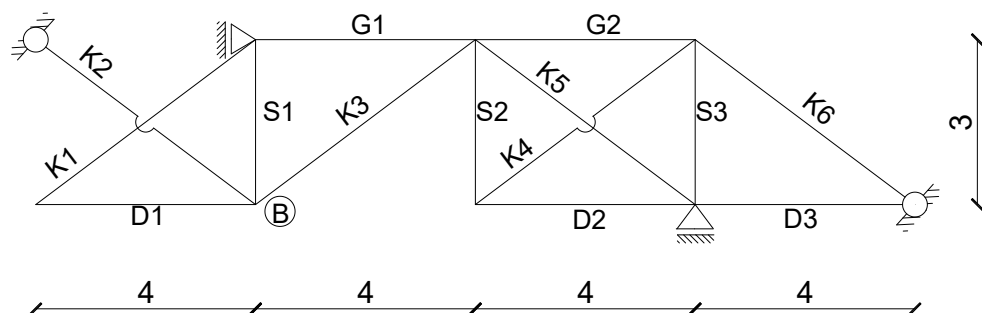
$$\sum M_H^L = -18 \cdot 8 + V_F \cdot 8 = 0 \rightarrow V_F = 18 \text{ kN}$$

Wykresy: obciążenie zewnętrzne – siły NO [kN]



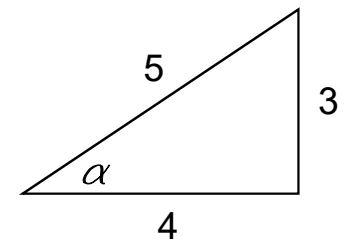
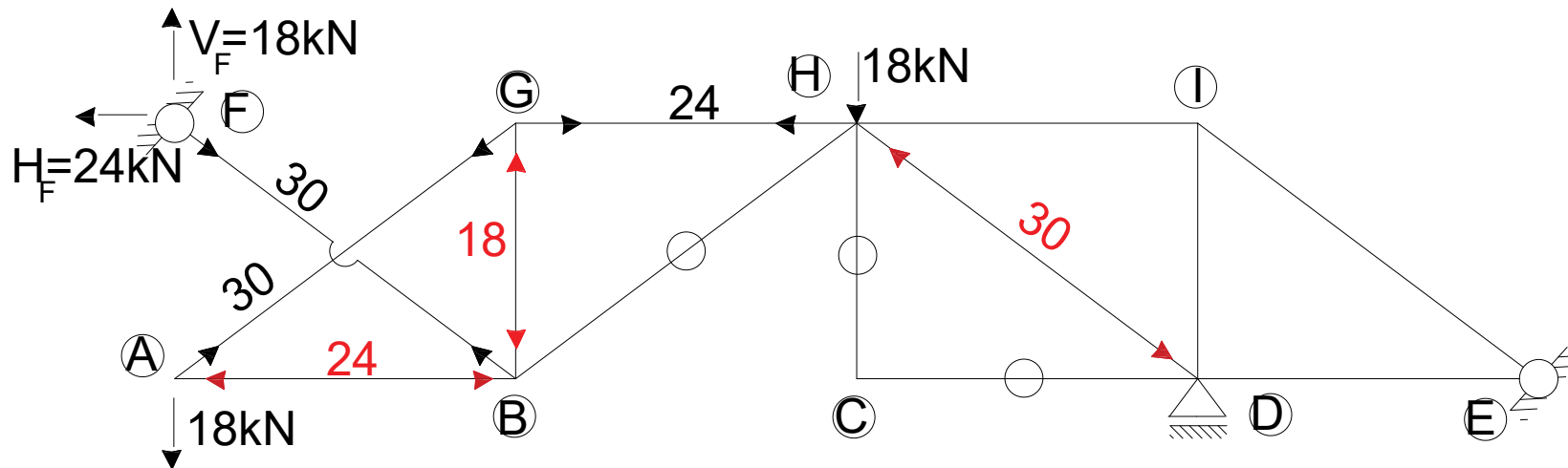
$$\cos \alpha = \frac{4}{5} = 0,8$$

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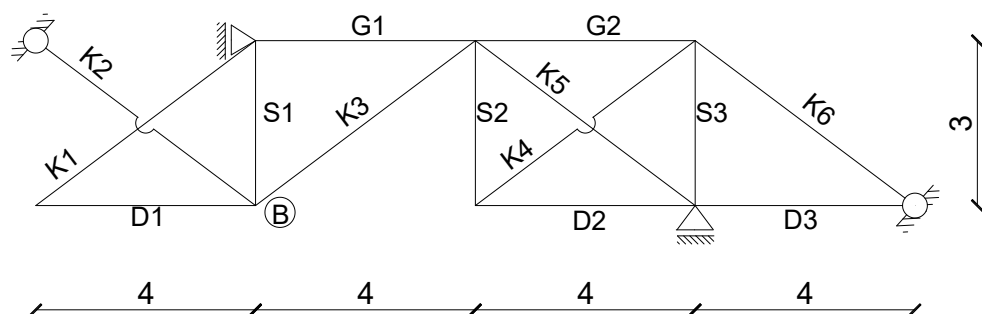


$$\sum M_H^L = -18 \cdot 8 + V_F \cdot 8 = 0 \rightarrow V_F = 18\text{ kN}$$

Wykresy: obciążenie zewnętrzne – siły N0 [kN]

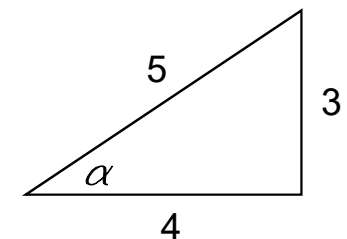
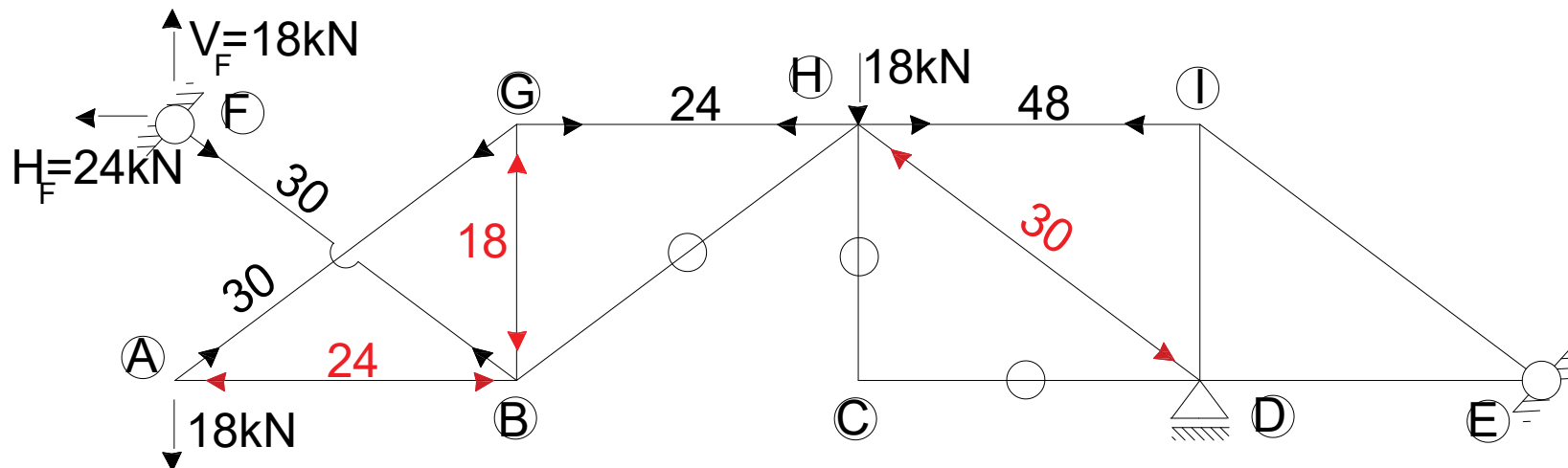


$$\begin{aligned}\cos\alpha &= \frac{4}{5} = 0,8 \\ \sin\alpha &= \frac{3}{5} = 0,6\end{aligned}$$



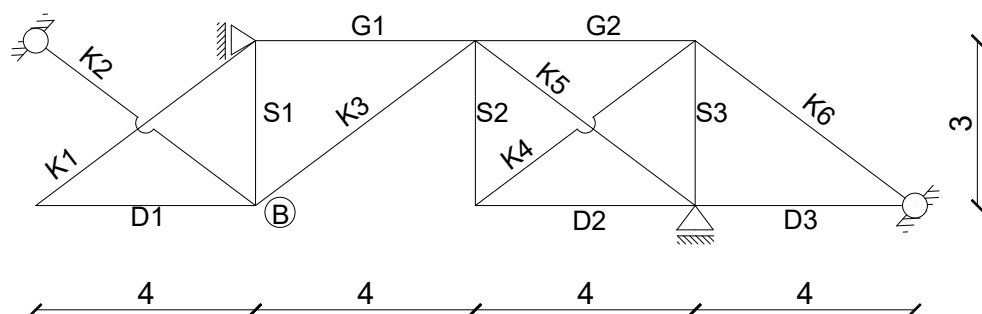
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Wykresy: obciążenie zewnętrzne – siły NO [kN]



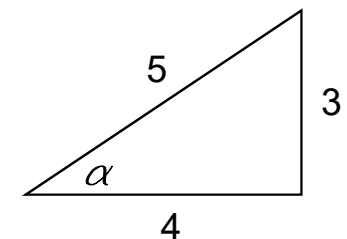
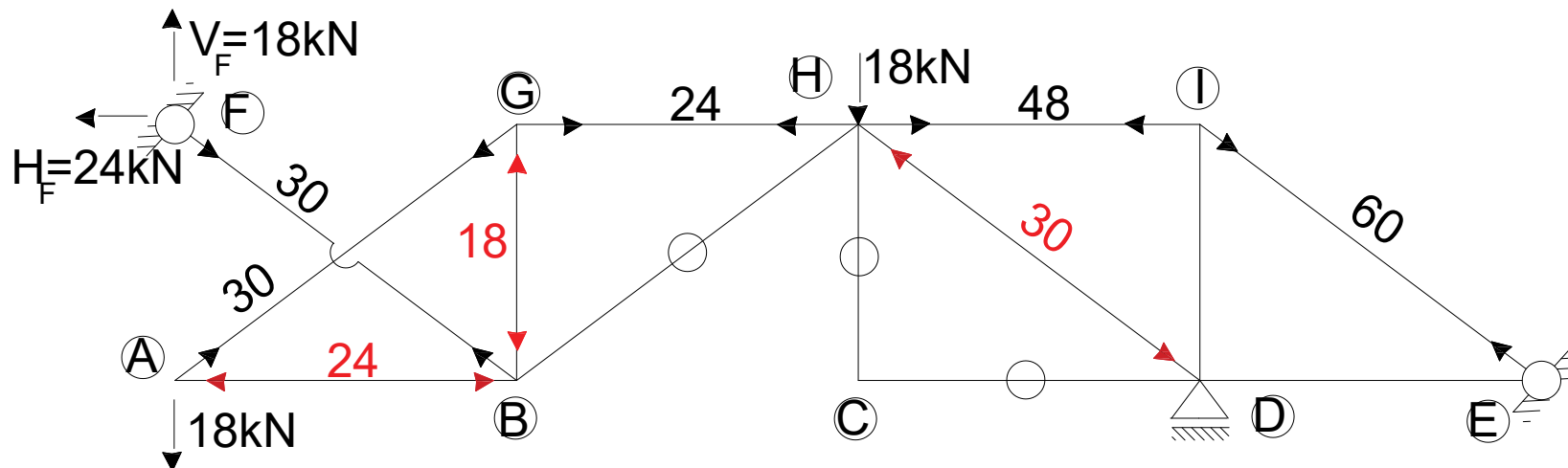
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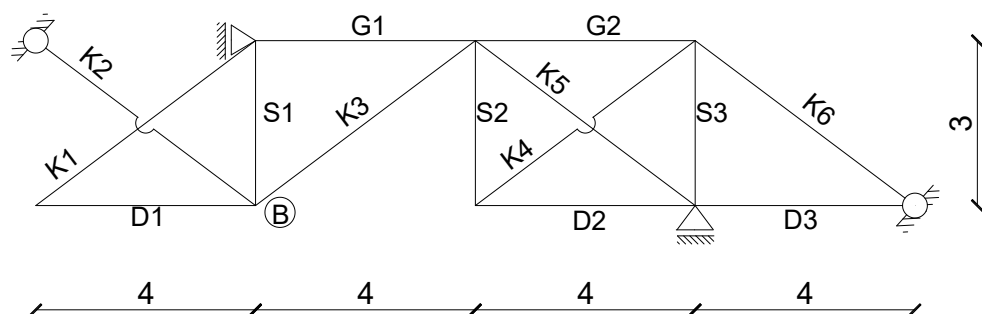
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Wykresy: obciążenie zewnętrzne – siły NO [kN]



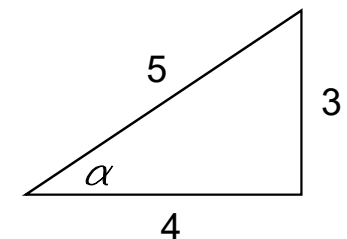
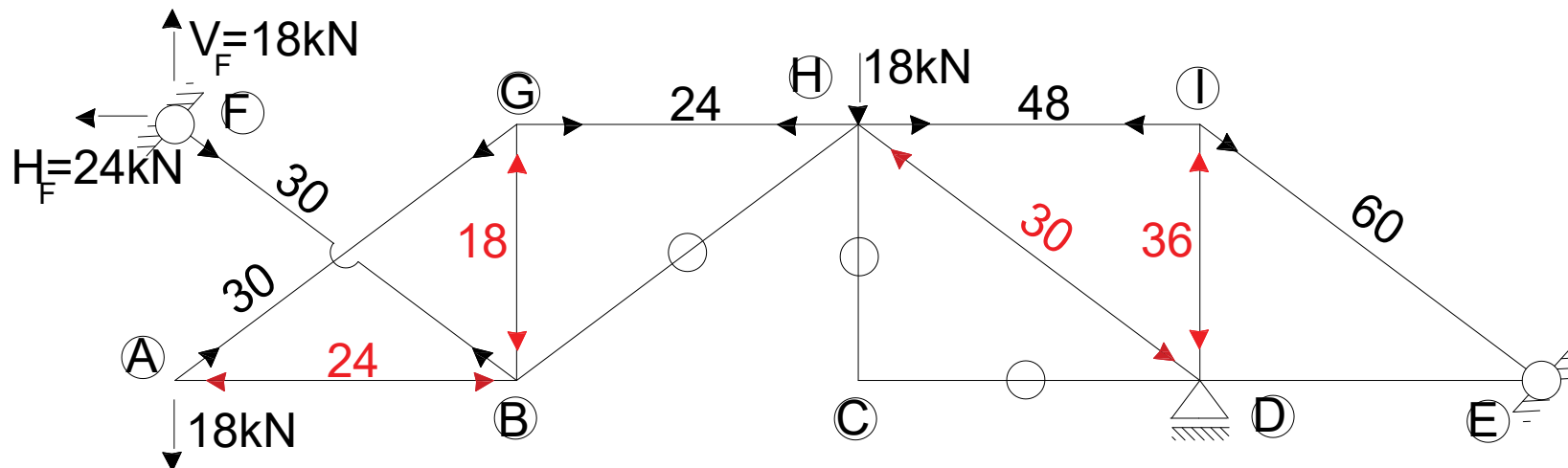
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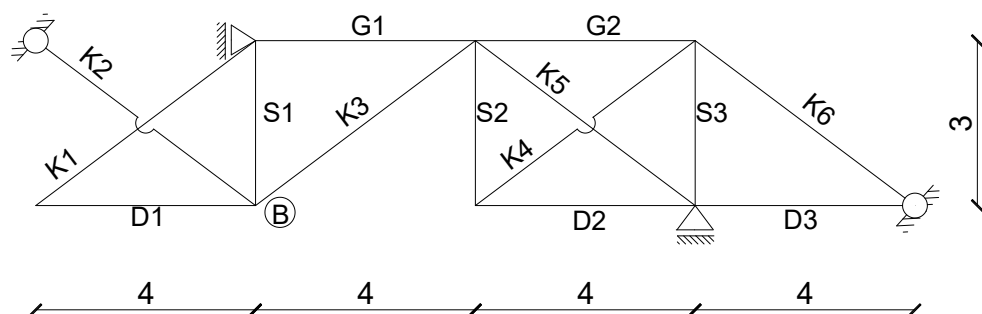
$$\sum M_H^L = -18 \cdot 8 + V_F \cdot 8 = 0 \rightarrow V_F = 18 \text{ kN}$$

Wykresy: obciążenie zewnętrzne – siły N0 [kN]



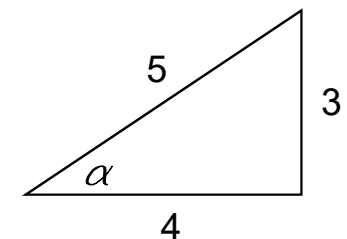
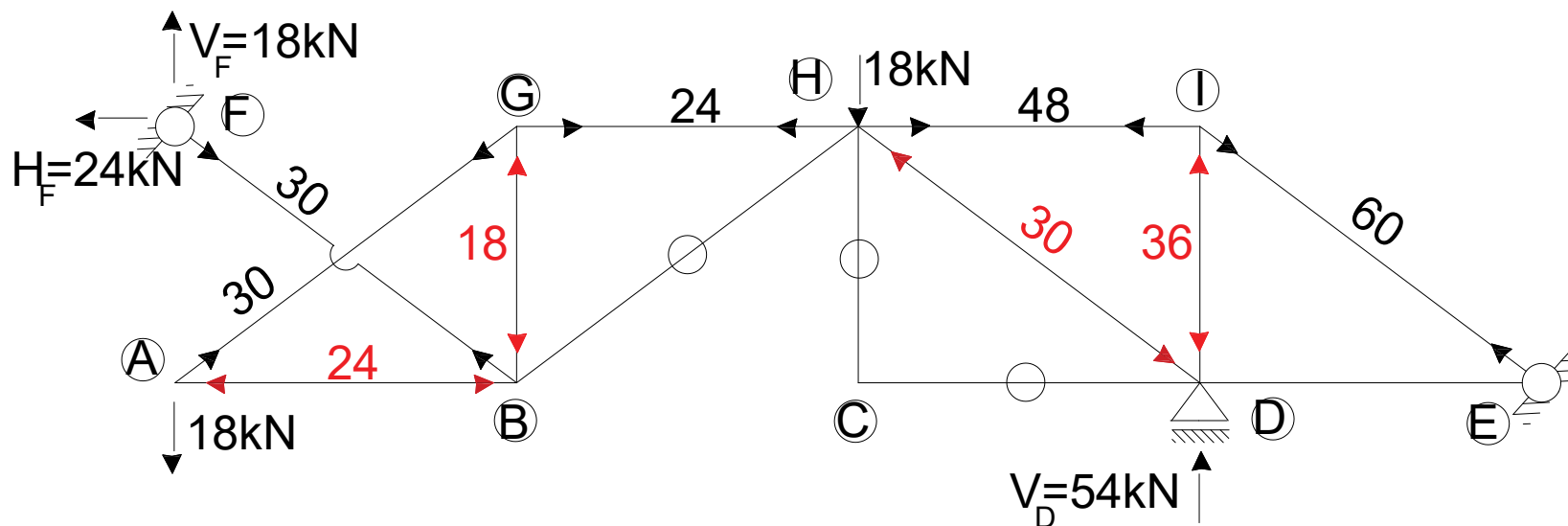
$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$



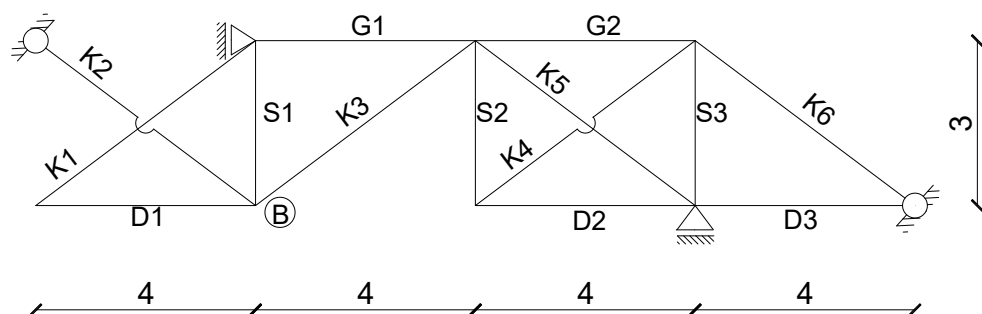
$$\sum M_H^L = -18 \cdot 8 + V_F \cdot 8 = 0 \rightarrow V_F = 18 \text{ kN}$$

Wykresy: obciążenie zewnętrzne – siły NO [kN]



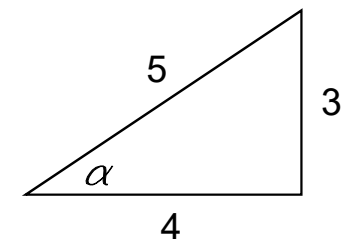
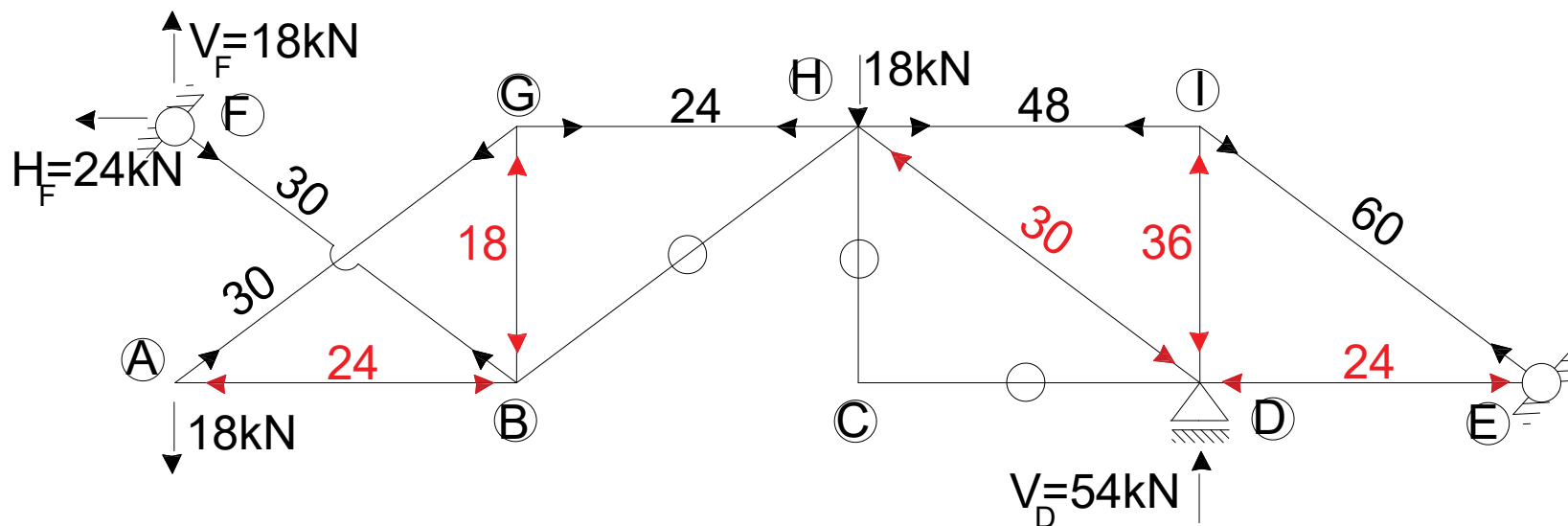
$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$



$$\sum M_H^L = -18 \cdot 8 + V_F \cdot 8 = 0 \rightarrow V_F = 18\text{ kN}$$

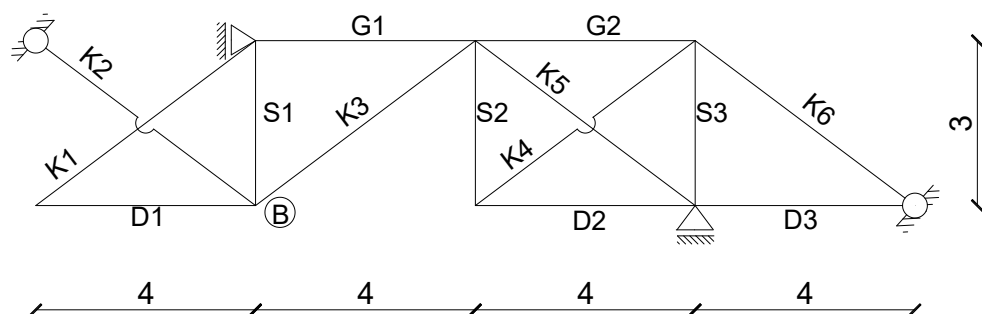
Wykresy: obciążenie zewnętrzne – siły N0 [kN]



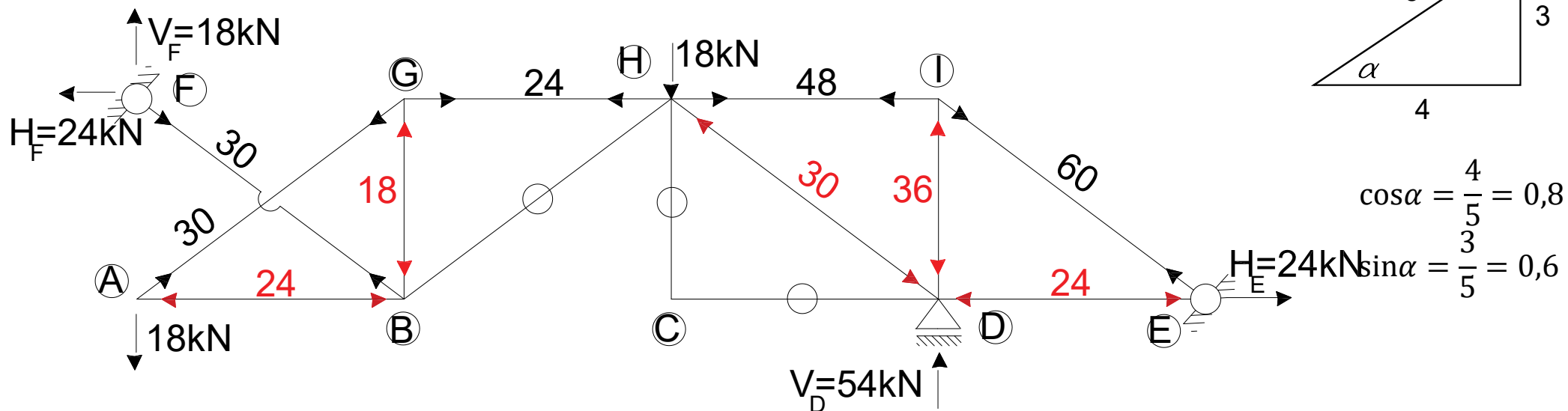
$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$

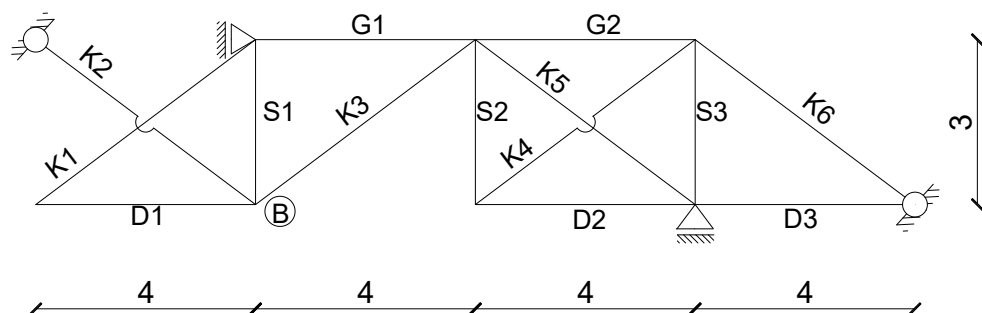
$$\sum M_H^L = -18 \cdot 8 + V_F \cdot 8 = 0 \rightarrow V_F = 18\text{ kN}$$



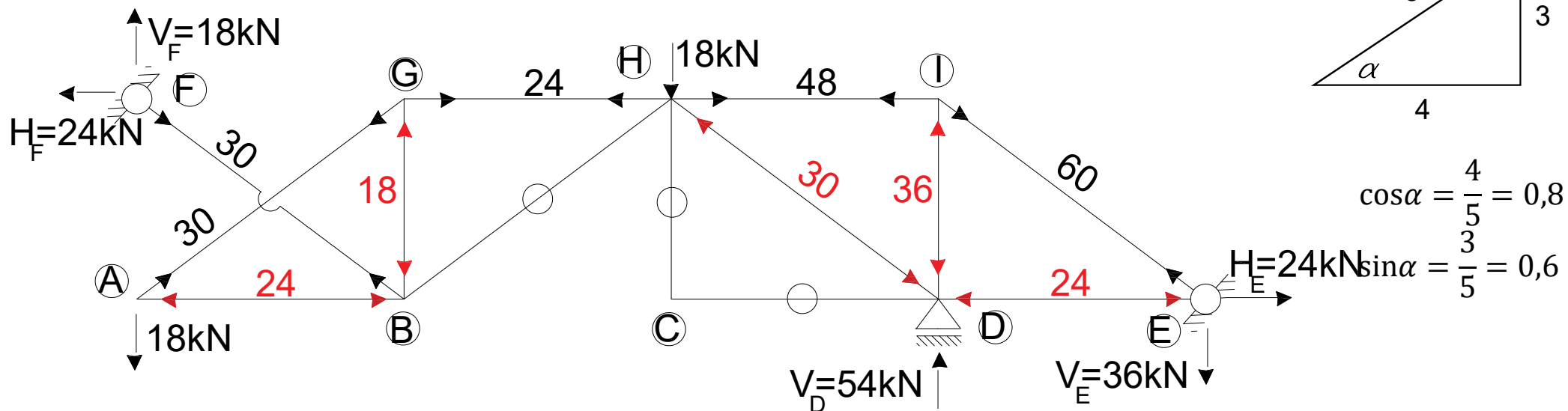
Wykresy: obciążenie zewnętrzne – siły NO [kN]



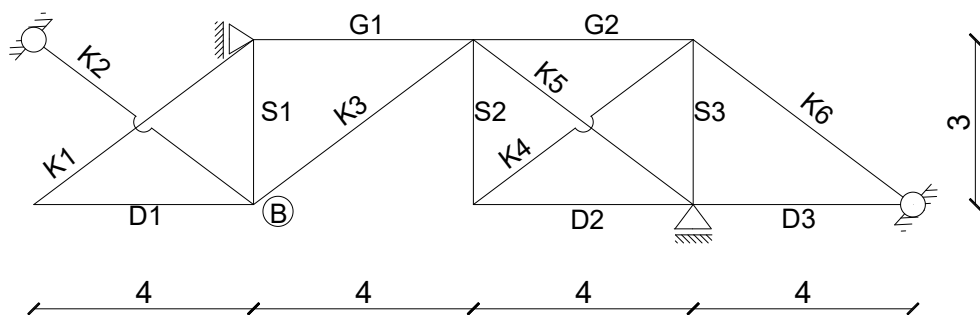
$$\sum M_H^L = -18 \cdot 8 + V_F \cdot 8 = 0 \rightarrow V_F = 18 \text{ kN}$$



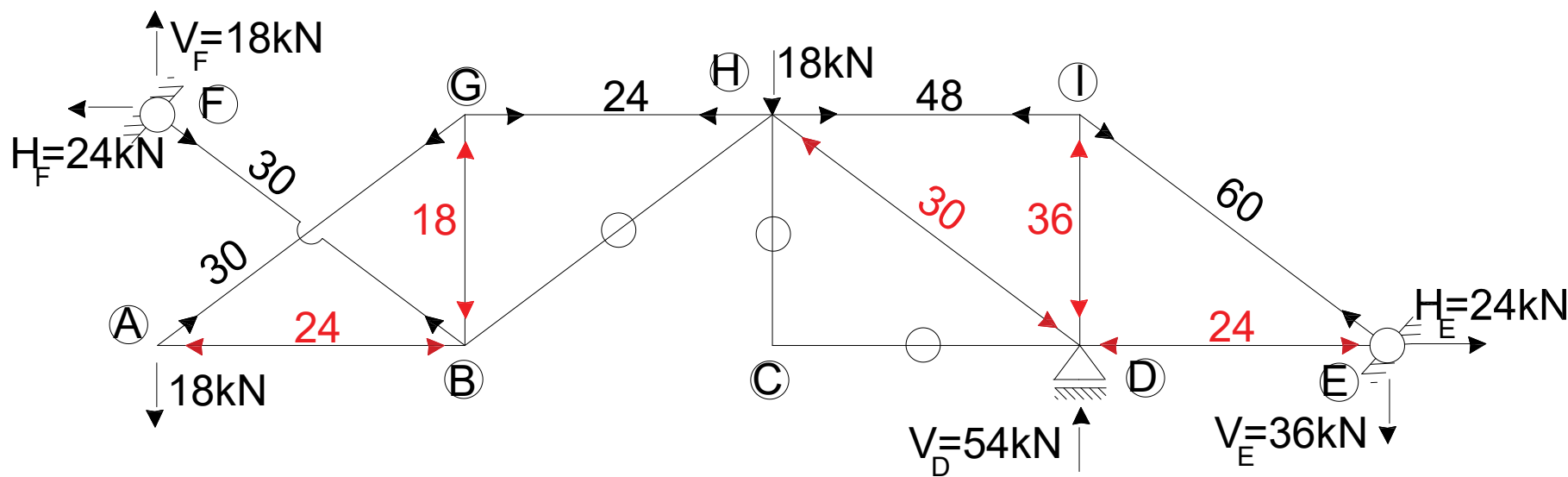
Wykresy: obciążenie zewnętrzne – siły NO [kN]



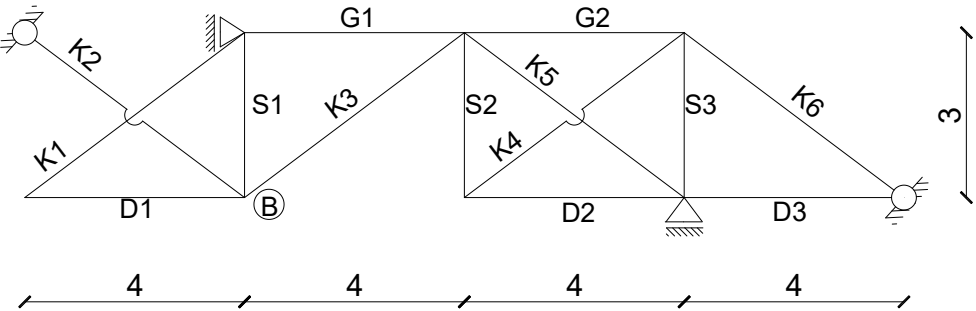
$$\sum M_H^L = -18 \cdot 8 + V_F \cdot 8 = 0 \rightarrow V_F = 18 \text{ kN}$$



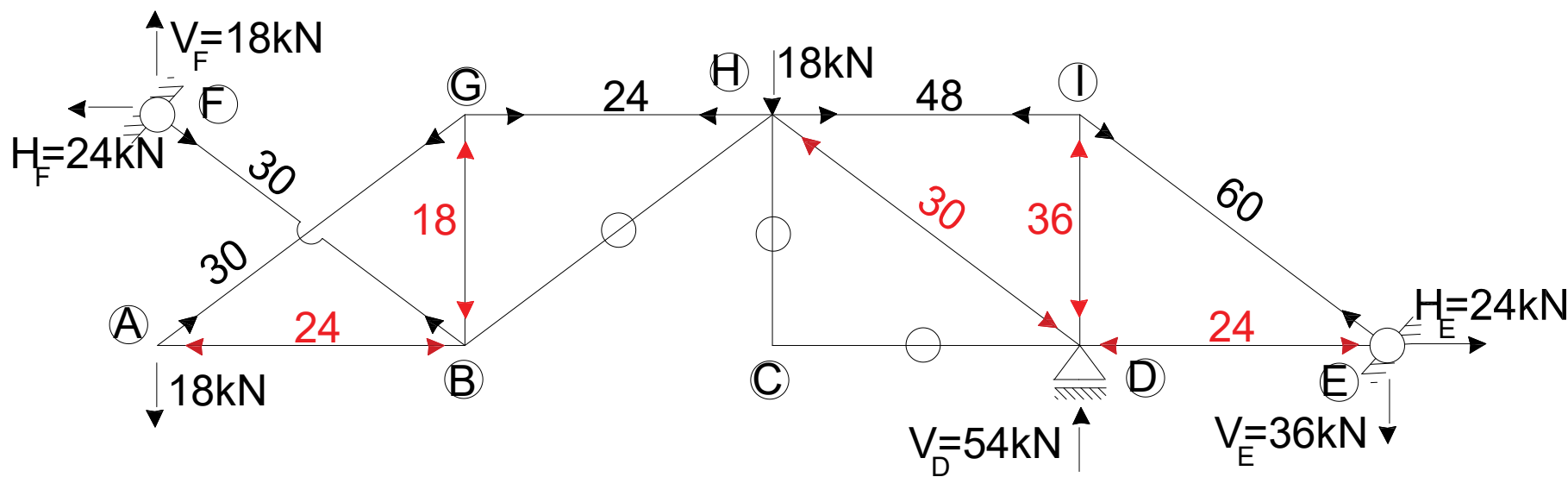
Wykresy: obciążenie zewnętrzne – siły N0 [kN]



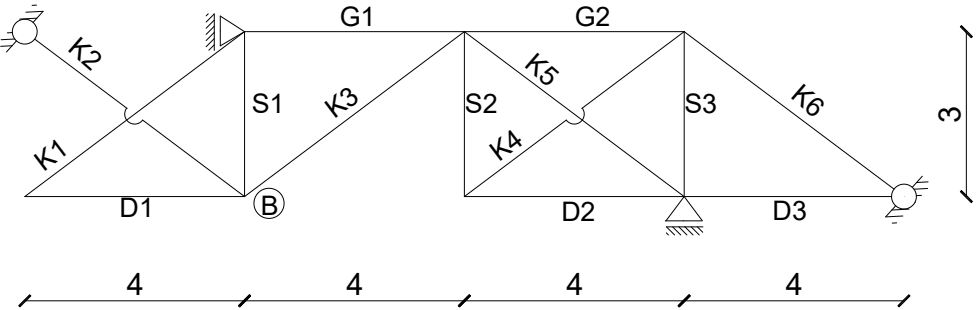
Pręt	L/EA	N0
D1	4	
D2	4	
D3	4	
G1	4	
G2	4	
S1	3	
S2	3	
S3	3	
K1	2,5	
K2	2,5	
K3	2,5	
K4	2,5	
K5	2,5	
K6	2,5	



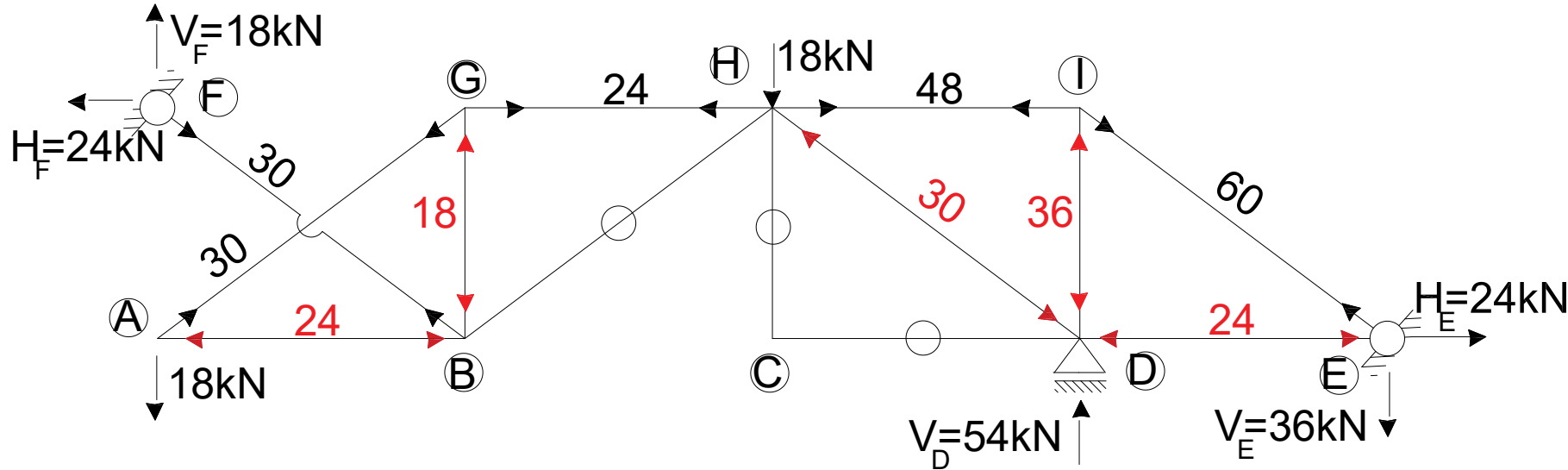
Wykresy: obciążenie zewnętrzne – siły N0 [kN]



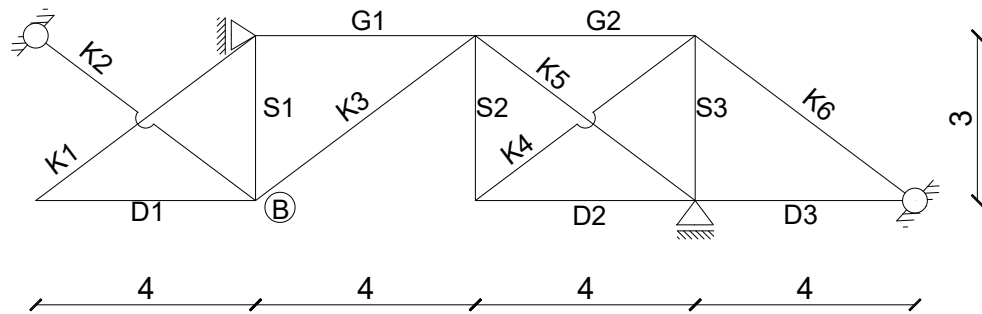
Pręt	L/EA	N0
D1	4	-24
D2	4	
D3	4	
G1	4	
G2	4	
S1	3	
S2	3	
S3	3	
K1	2,5	
K2	2,5	
K3	2,5	
K4	2,5	
K5	2,5	
K6	2,5	



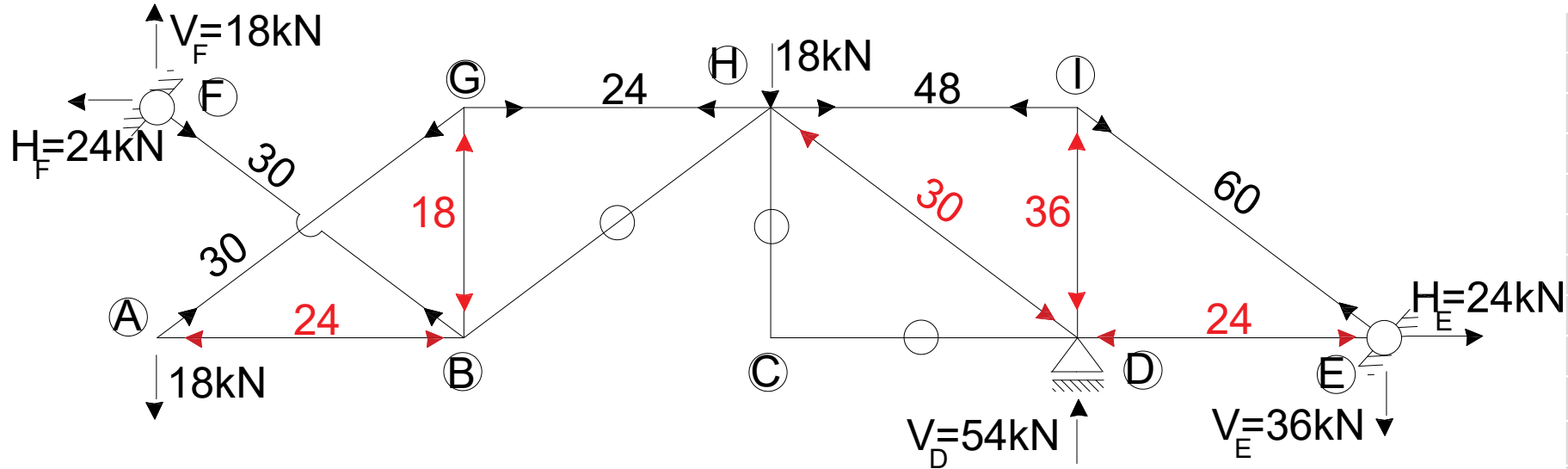
Wykresy: obciążenie zewnętrzne – siły N0 [kN]



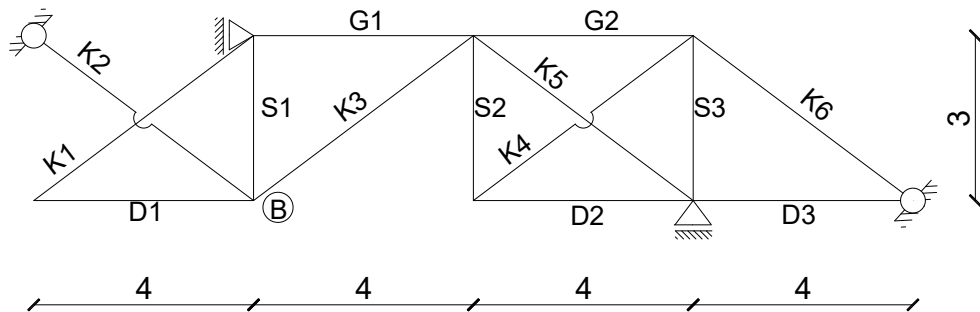
Pręt	L/EA	N0
D1	4	-24
D2	4	0
D3	4	
G1	4	
G2	4	
S1	3	
S2	3	
S3	3	
K1	2,5	
K2	2,5	
K3	2,5	
K4	2,5	
K5	2,5	
K6	2,5	



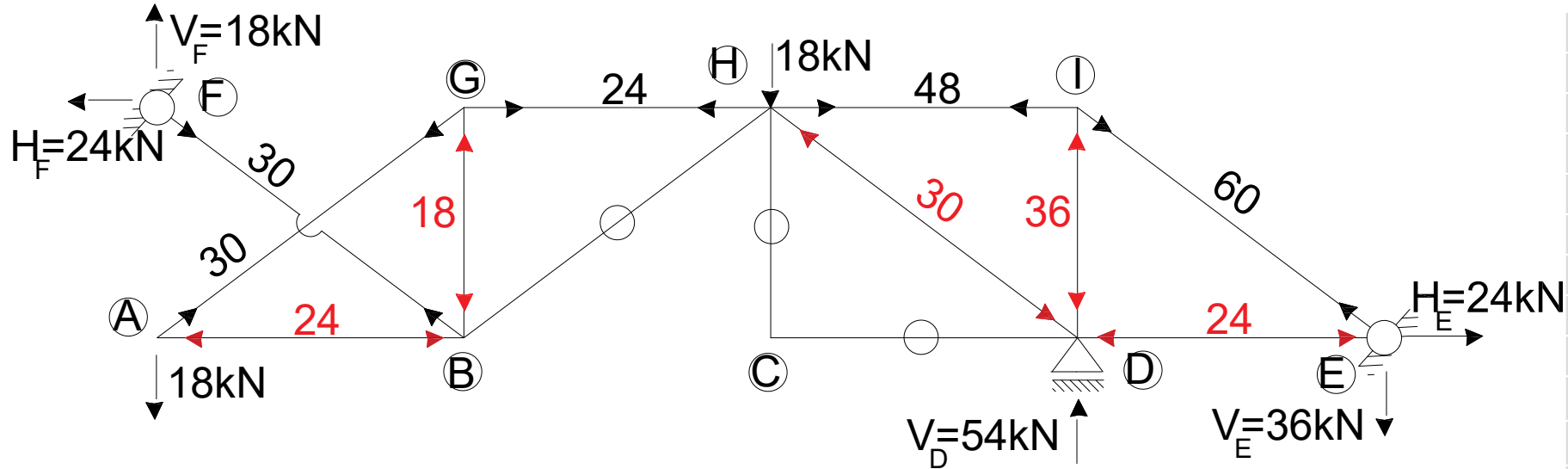
Wykresy: obciążenie zewnętrzne – siły N0 [kN]



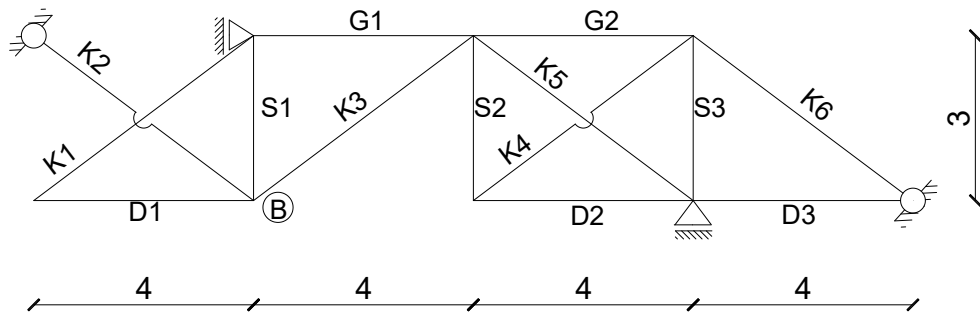
Pręt	L/EA	N0
D1	4	-24
D2	4	0
D3	4	-24
G1	4	
G2	4	
S1	3	
S2	3	
S3	3	
K1	2,5	
K2	2,5	
K3	2,5	
K4	2,5	
K5	2,5	
K6	2,5	



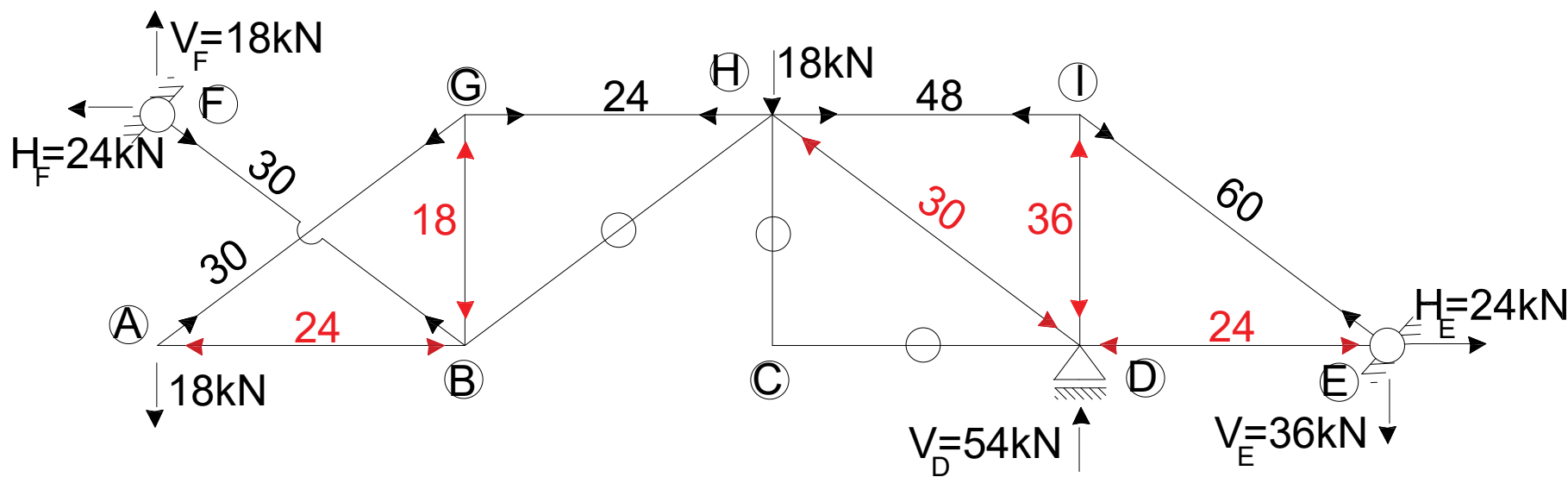
Wykresy: obciążenie zewnętrzne – siły N0 [kN]



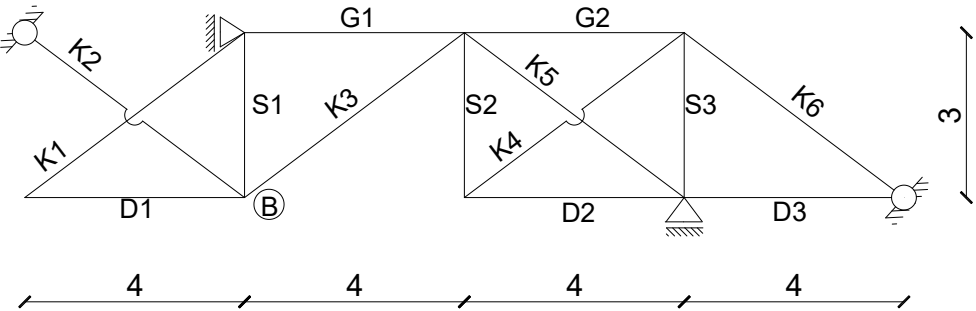
Pręt	L/EA	N0
D1	4	-24
D2	4	0
D3	4	-24
G1	4	24
G2	4	
S1	3	
S2	3	
S3	3	
K1	2,5	
K2	2,5	
K3	2,5	
K4	2,5	
K5	2,5	
K6	2,5	



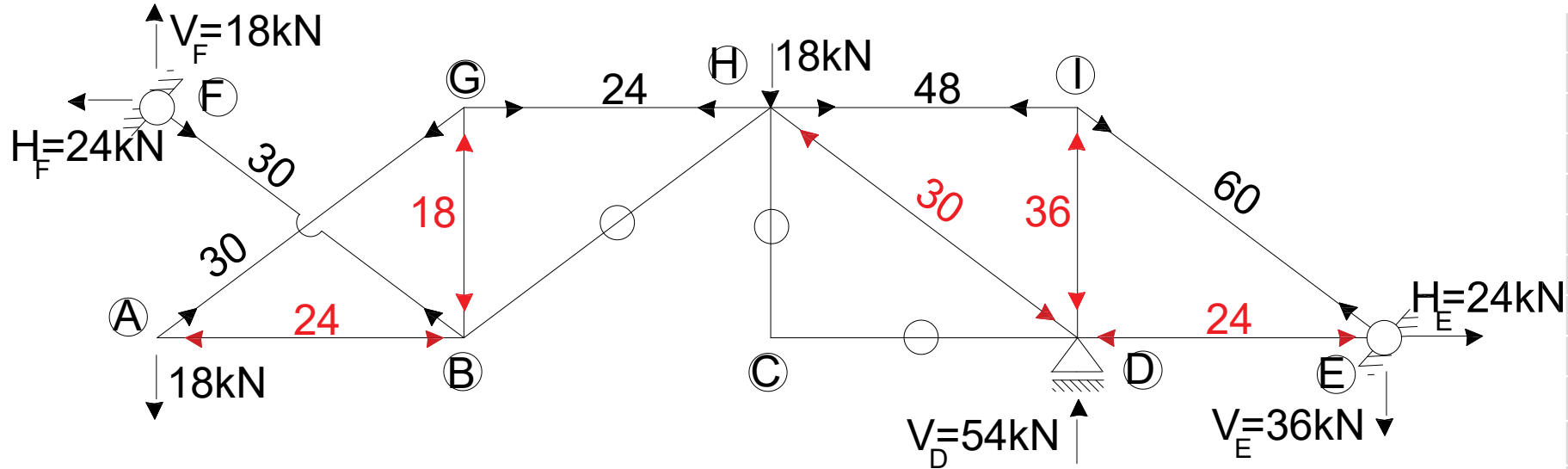
Wykresy: obciążenie zewnętrzne – siły N0 [kN]



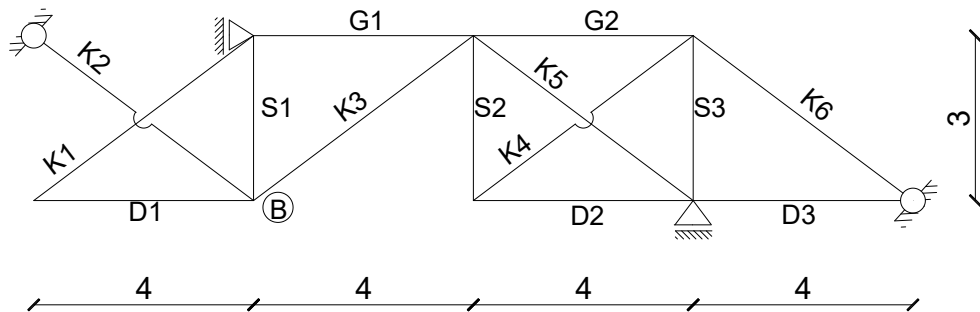
Pręt	L/EA	N0
D1	4	-24
D2	4	0
D3	4	-24
G1	4	24
G2	4	48
S1	3	
S2	3	
S3	3	
K1	2,5	
K2	2,5	
K3	2,5	
K4	2,5	
K5	2,5	
K6	2,5	



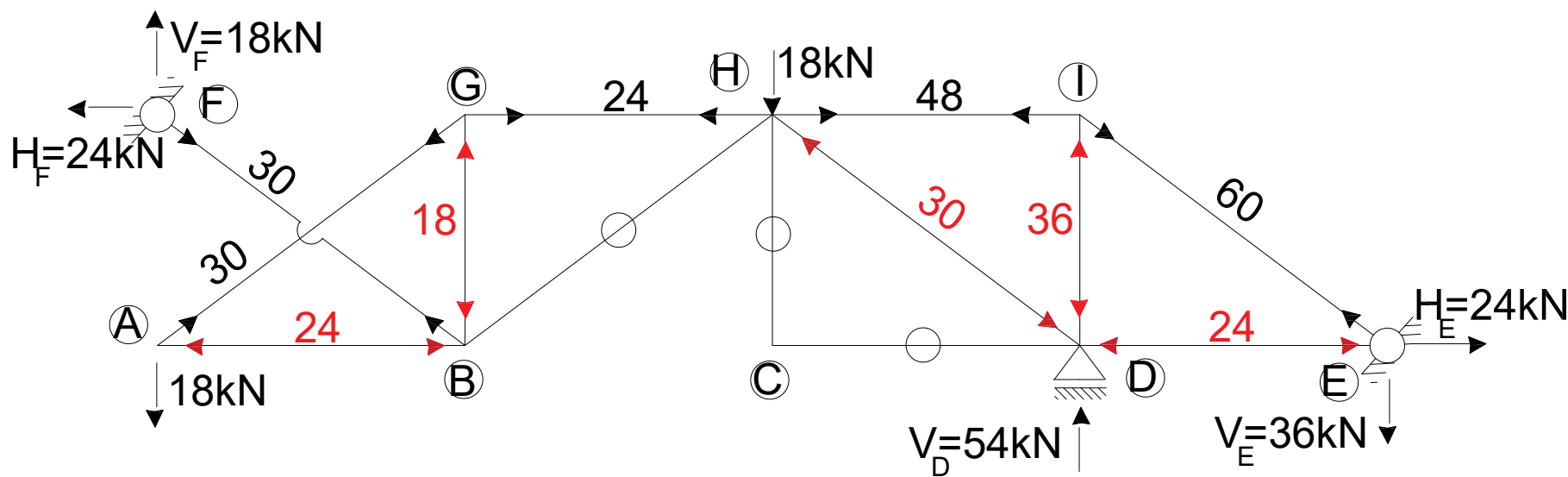
Wykresy: obciążenie zewnętrzne – siły N0 [kN]



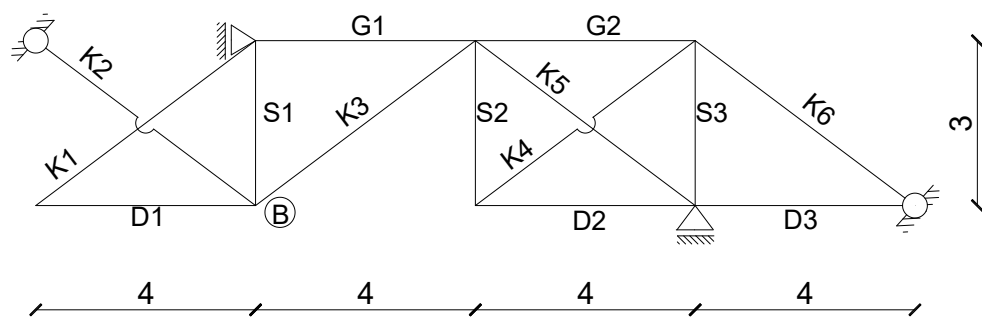
Pręt	L/EA	N0
D1	4	-24
D2	4	0
D3	4	-24
G1	4	24
G2	4	48
S1	3	-18
S2	3	
S3	3	
K1	2,5	
K2	2,5	
K3	2,5	
K4	2,5	
K5	2,5	
K6	2,5	



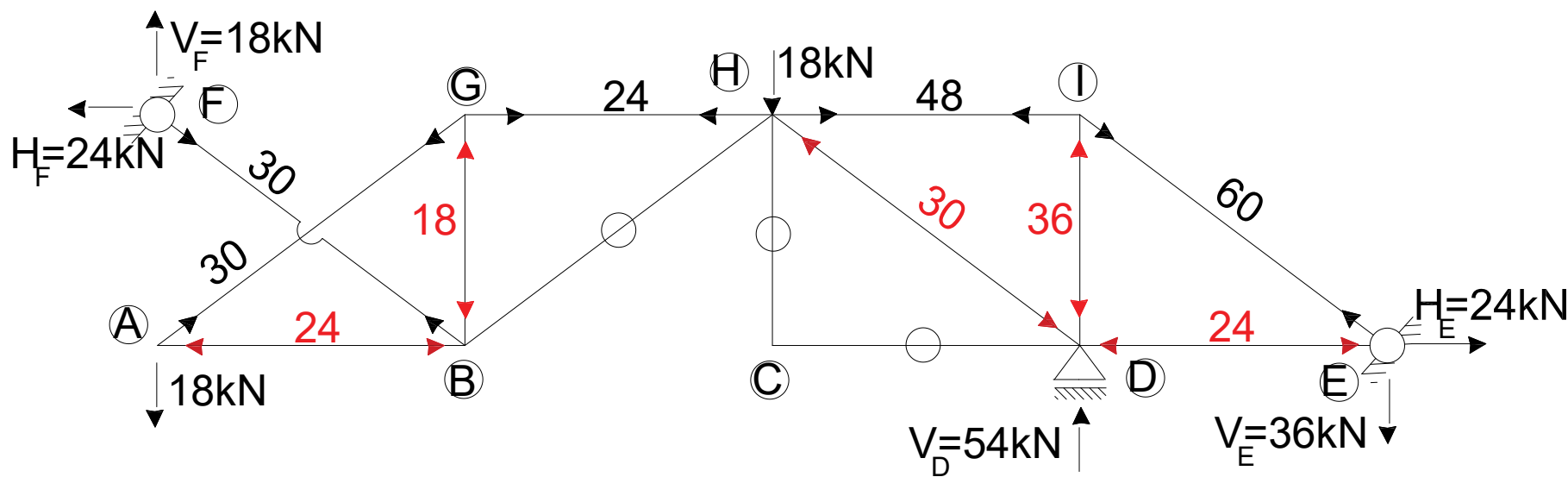
Wykresy: obciążenie zewnętrzne – siły N0 [kN]



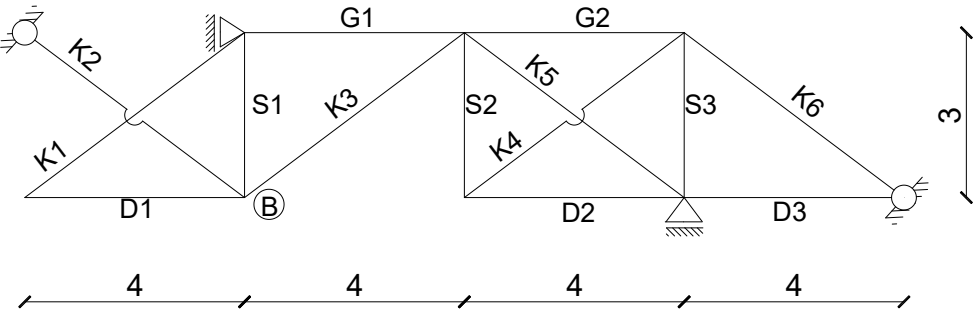
Pręt	L/EA	N0
D1	4	-24
D2	4	0
D3	4	-24
G1	4	24
G2	4	48
S1	3	-18
S2	3	0
S3	3	
K1	2,5	
K2	2,5	
K3	2,5	
K4	2,5	
K5	2,5	
K6	2,5	



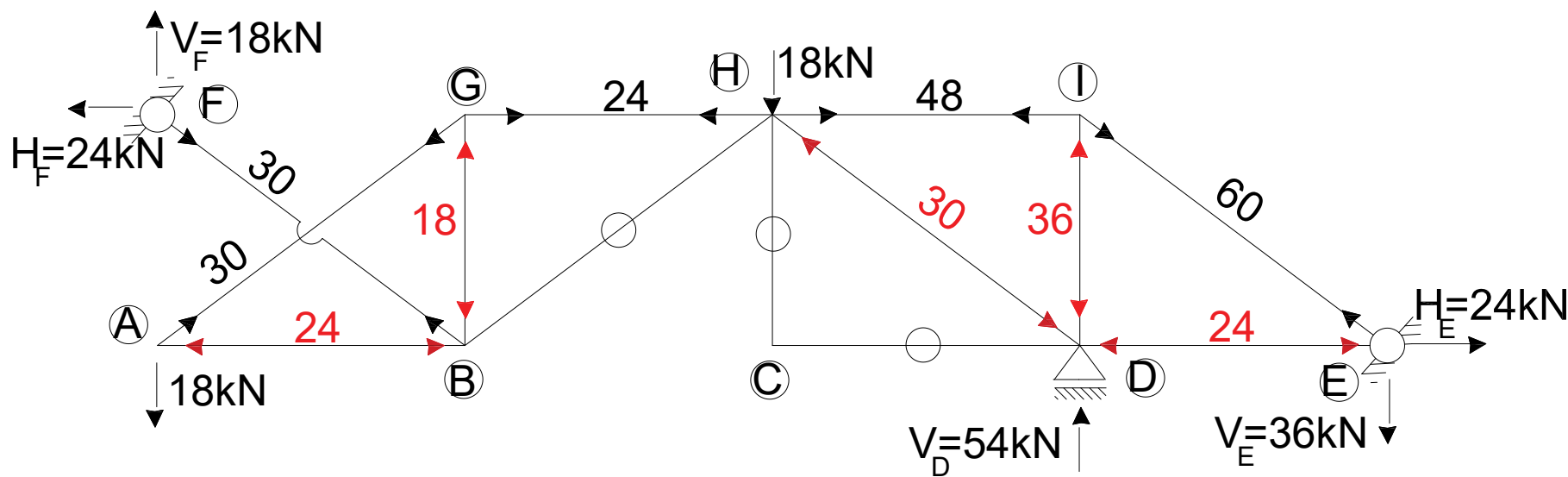
Wykresy: obciążenie zewnętrzne – siły N0 [kN]



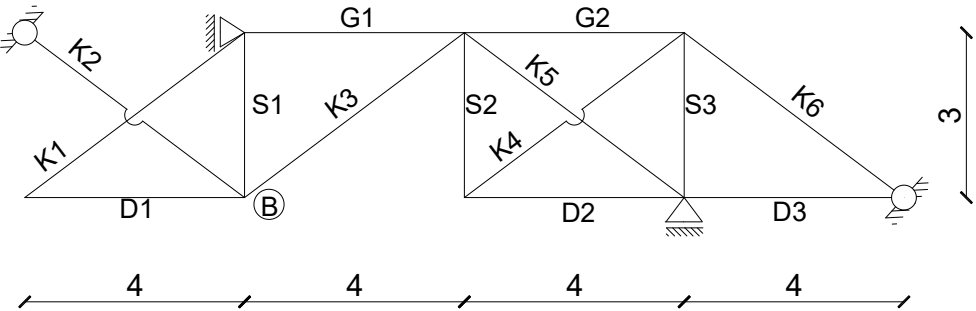
Pręt	L/EA	N0
D1	4	-24
D2	4	0
D3	4	-24
G1	4	24
G2	4	48
S1	3	-18
S2	3	0
S3	3	-36
K1	2,5	
K2	2,5	
K3	2,5	
K4	2,5	
K5	2,5	
K6	2,5	



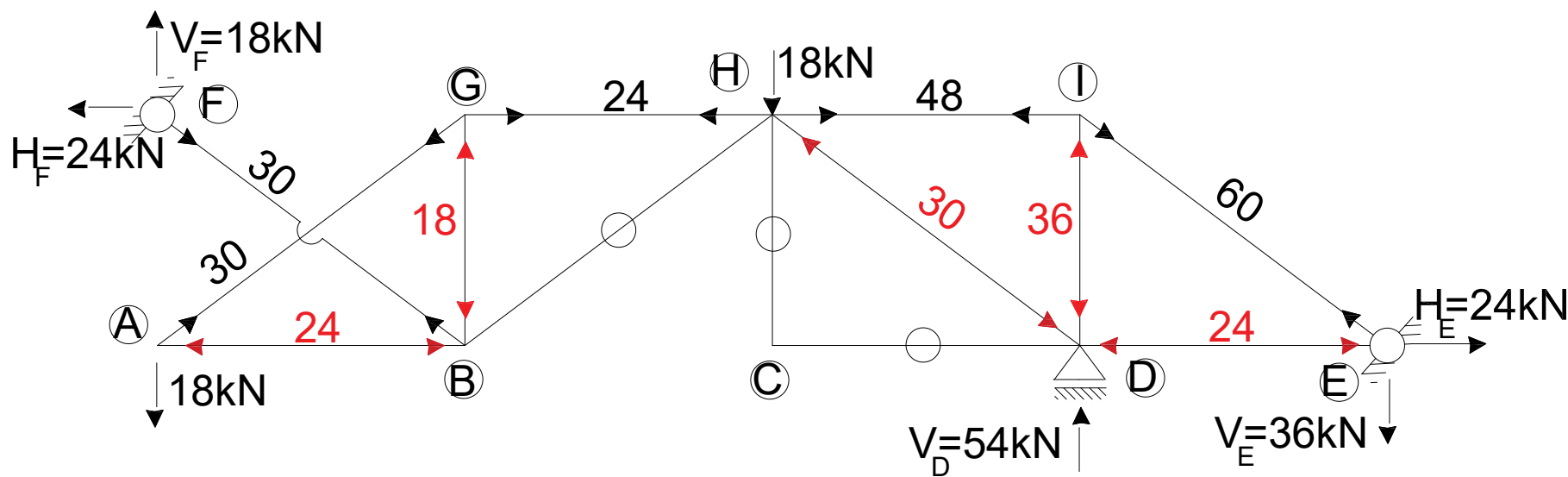
Wykresy: obciążenie zewnętrzne – siły N0 [kN]



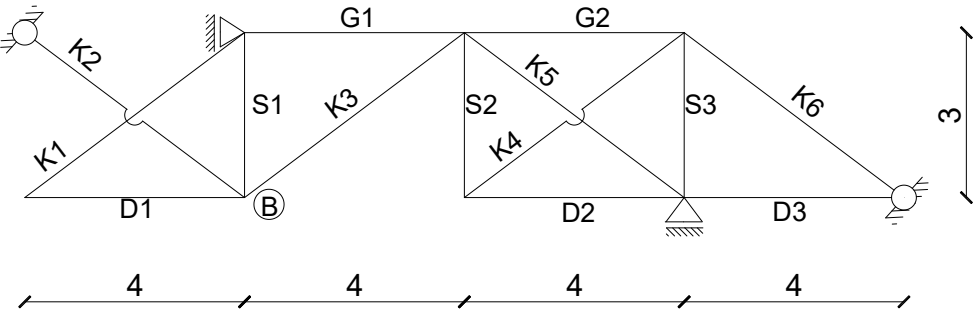
Pręt	L/EA	N0
D1	4	-24
D2	4	0
D3	4	-24
G1	4	24
G2	4	48
S1	3	-18
S2	3	0
S3	3	-36
K1	2,5	30
K2	2,5	30
K3	2,5	
K4	2,5	
K5	2,5	
K6	2,5	



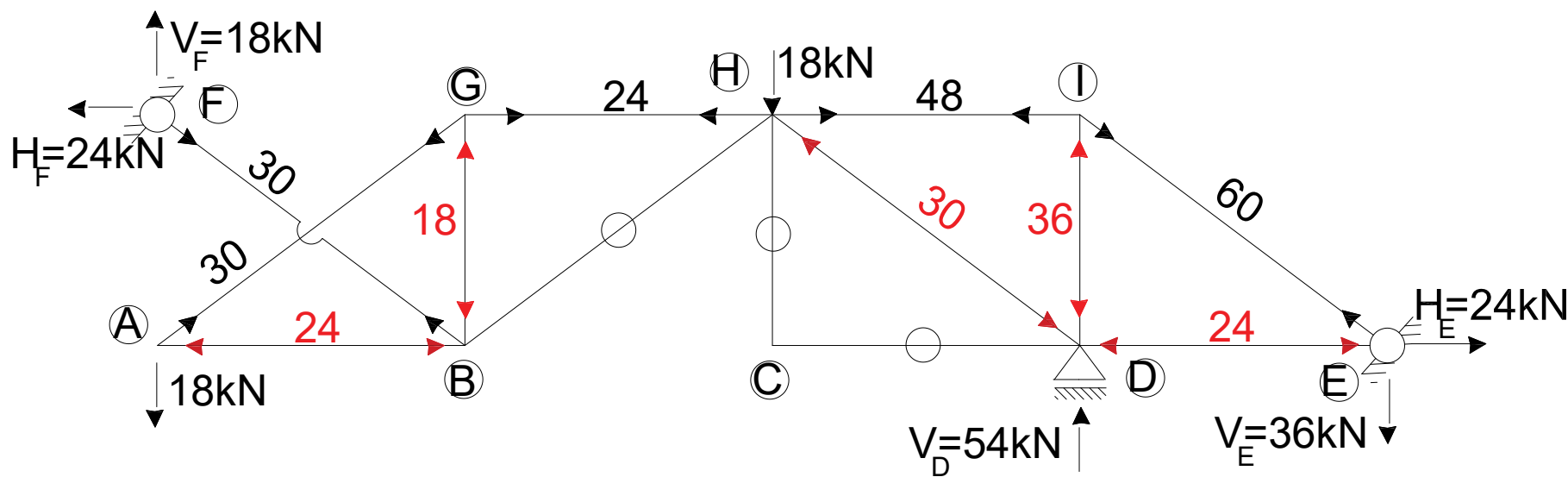
Wykresy: obciążenie zewnętrzne – siły N0 [kN]



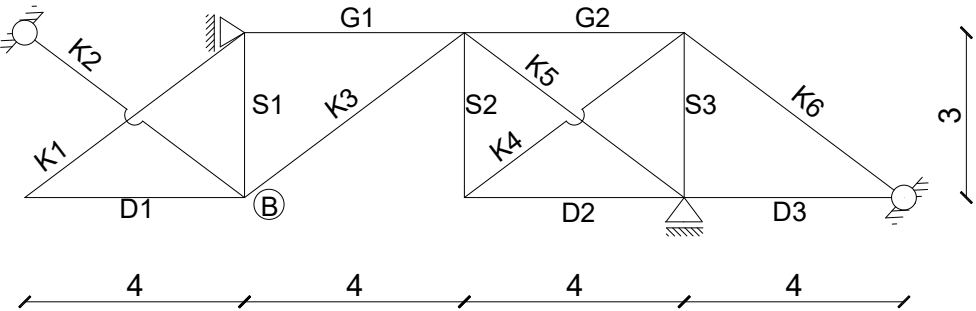
Pręt	L/EA	N0
D1	4	-24
D2	4	0
D3	4	-24
G1	4	24
G2	4	48
S1	3	-18
S2	3	0
S3	3	-36
K1	2,5	30
K2	2,5	30
K3	2,5	0
K4	2,5	0
K5	2,5	
K6	2,5	



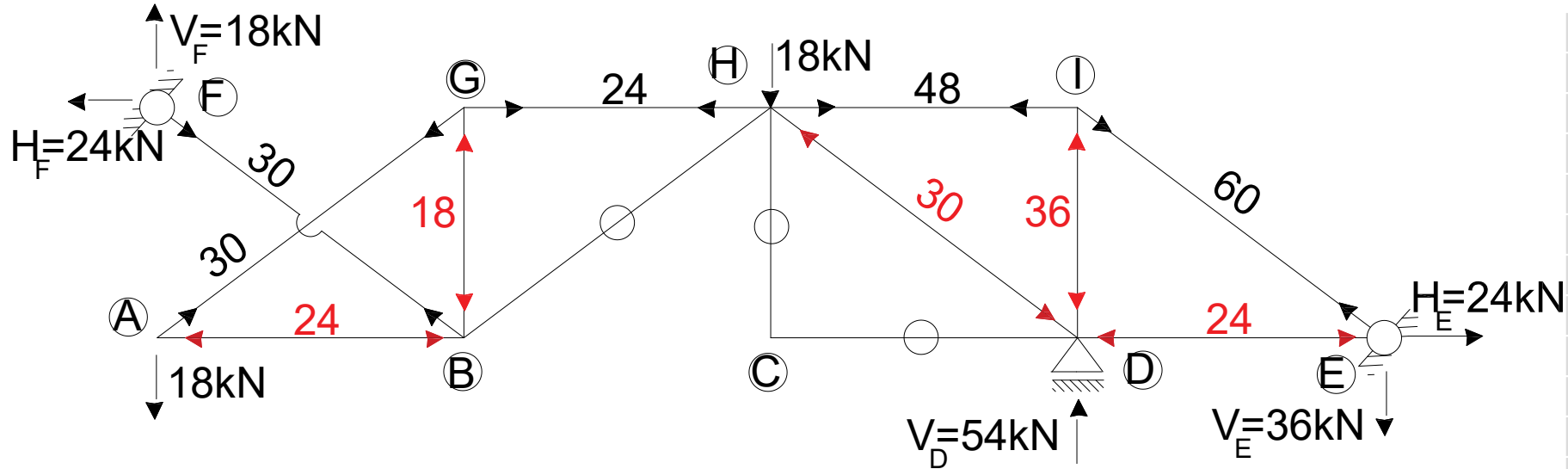
Wykresy: obciążenie zewnętrzne – siły N0 [kN]



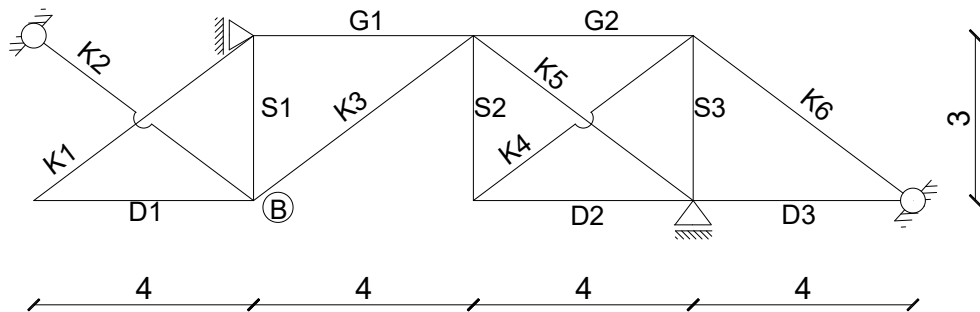
Pręt	L/EA	N0
D1	4	-24
D2	4	0
D3	4	-24
G1	4	24
G2	4	48
S1	3	-18
S2	3	0
S3	3	-36
K1	2,5	30
K2	2,5	30
K3	2,5	0
K4	2,5	0
K5	2,5	-30
K6	2,5	



Wykresy: obciążenie zewnętrzne – siły N0 [kN]



Pręt	L/EA	N0
D1	4	-24
D2	4	0
D3	4	-24
G1	4	24
G2	4	48
S1	3	-18
S2	3	0
S3	3	-36
K1	2,5	30
K2	2,5	30
K3	2,5	0
K4	2,5	0
K5	2,5	-30
K6	2,5	60



Obliczenia metody sił:

Obliczenia metody sił:

Pręt	L/EA	N1	N2	N0										
D1	4	0	0	-24										
D2	4	-0,8	0	0										
D3	4	0	0	-24										
G1	4	0	-1	24										
G2	4	-0,8	-1	48										
S1	3	0	0	-18										
S2	3	-0,6	0	0										
S3	3	-0,6	0,75	-36										
K1	2,5	0	0	30										
K2	2,5	0	0	30										
K3	2,5	0	0	0										
K4	2,5	1	0	0										
K5	2,5	1	0	-30										
K6	2,5	0	-1,25	60										

Obliczenia metody sił:

Pręt	L/EA	N1	N2	N0	$\frac{N1 \cdot N1 \cdot L}{EA}$									
D1	4	0	0	-24										
D2	4	-0,8	0	0										
D3	4	0	0	-24										
G1	4	0	-1	24										
G2	4	-0,8	-1	48										
S1	3	0	0	-18										
S2	3	-0,6	0	0										
S3	3	-0,6	0,75	-36										
K1	2,5	0	0	30										
K2	2,5	0	0	30										
K3	2,5	0	0	0										
K4	2,5	1	0	0										
K5	2,5	1	0	-30										
K6	2,5	0	-1,25	60										

Obliczenia metody sił:

Pręt	L/EA	N1	N2	N0	N1*N1*L EA									
D1	4	0	0	-24	0									
D2	4	-0,8	0	0	2,56									
D3	4	0	0	-24	0									
G1	4	0	-1	24	0									
G2	4	-0,8	-1	48	2,56									
S1	3	0	0	-18	0									
S2	3	-0,6	0	0	1,08									
S3	3	-0,6	0,75	-36	1,08									
K1	2,5	0	0	30	0									
K2	2,5	0	0	30	0									
K3	2,5	0	0	0	0									
K4	2,5	1	0	0	2,5									
K5	2,5	1	0	-30	2,5									
K6	2,5	0	-1,25	60	0									

Obliczenia metody sił:

Pręt	L/EA	N1	N2	N0	$\frac{N1 \cdot N1 \cdot L}{EA}$									
D1	4	0	0	-24	0									
D2	4	-0,8	0	0	2,56									
D3	4	0	0	-24	0									
G1	4	0	-1	24	0									
G2	4	-0,8	-1	48	2,56									
S1	3	0	0	-18	0									
S2	3	-0,6	0	0	1,08									
S3	3	-0,6	0,75	-36	1,08									
K1	2,5	0	0	30	0									
K2	2,5	0	0	30	0									
K3	2,5	0	0	0	0									
K4	2,5	1	0	0	2,5									
K5	2,5	1	0	-30	2,5									
K6	2,5	0	-1,25	60	0									
12,28														

δ₁₁

Obliczenia metody sił:

Pręt	L/EA	N1	N2	N0	$\frac{N1 \cdot N1 \cdot L}{EA}$	$\frac{N1 \cdot N2 \cdot L}{EA}$								
D1	4	0	0	-24	0									
D2	4	-0,8	0	0	2,56									
D3	4	0	0	-24	0									
G1	4	0	-1	24	0									
G2	4	-0,8	-1	48	2,56									
S1	3	0	0	-18	0									
S2	3	-0,6	0	0	1,08									
S3	3	-0,6	0,75	-36	1,08									
K1	2,5	0	0	30	0									
K2	2,5	0	0	30	0									
K3	2,5	0	0	0	0									
K4	2,5	1	0	0	2,5									
K5	2,5	1	0	-30	2,5									
K6	2,5	0	-1,25	60	0									
					12,28									

δ11

Obliczenia metody sił:

Pręt	L/EA	N1	N2	N0	<u>N1*N1*L</u> EA	<u>N1*N2*L</u> EA								
D1	4	0	0	-24	0	0								
D2	4	-0,8	0	0	2,56	0								
D3	4	0	0	-24	0	0								
G1	4	0	-1	24	0	0								
G2	4	-0,8	-1	48	2,56	3,2								
S1	3	0	0	-18	0	0								
S2	3	-0,6	0	0	1,08	0								
S3	3	-0,6	0,75	-36	1,08	-1,35								
K1	2,5	0	0	30	0	0								
K2	2,5	0	0	30	0	0								
K3	2,5	0	0	0	0	0								
K4	2,5	1	0	0	2,5	0								
K5	2,5	1	0	-30	2,5	0								
K6	2,5	0	-1,25	60	0	0								
					12,28									

δ₁₁

Obliczenia metody sił:

Pręt	L/EA	N1	N2	N0	<u>N1*N1*L</u> EA	<u>N1*N2*L</u> EA								
D1	4	0	0	-24	0	0								
D2	4	-0,8	0	0	2,56	0								
D3	4	0	0	-24	0	0								
G1	4	0	-1	24	0	0								
G2	4	-0,8	-1	48	2,56	3,2								
S1	3	0	0	-18	0	0								
S2	3	-0,6	0	0	1,08	0								
S3	3	-0,6	0,75	-36	1,08	-1,35								
K1	2,5	0	0	30	0	0								
K2	2,5	0	0	30	0	0								
K3	2,5	0	0	0	0	0								
K4	2,5	1	0	0	2,5	0								
K5	2,5	1	0	-30	2,5	0								
K6	2,5	0	-1,25	60	0	0								
					12,28	1,85								

δ11 δ12

Obliczenia metody sił:

Pręt	L/EA	N1	N2	N0	$\frac{N1 \cdot N1 \cdot L}{EA}$	$\frac{N1 \cdot N2 \cdot L}{EA}$	$\frac{N2 \cdot N2 \cdot L}{EA}$							
D1	4	0	0	-24	0	0								
D2	4	-0,8	0	0	2,56	0								
D3	4	0	0	-24	0	0								
G1	4	0	-1	24	0	0								
G2	4	-0,8	-1	48	2,56	3,2								
S1	3	0	0	-18	0	0								
S2	3	-0,6	0	0	1,08	0								
S3	3	-0,6	0,75	-36	1,08	-1,35								
K1	2,5	0	0	30	0	0								
K2	2,5	0	0	30	0	0								
K3	2,5	0	0	0	0	0								
K4	2,5	1	0	0	2,5	0								
K5	2,5	1	0	-30	2,5	0								
K6	2,5	0	-1,25	60	0	0								
					12,28	1,85								

δ11 δ12

Obliczenia metody sił:

Pręt	L/EA	N1	N2	N0	$\frac{N1 \cdot N1 \cdot L}{EA}$	$\frac{N1 \cdot N2 \cdot L}{EA}$	$\frac{N2 \cdot N2 \cdot L}{EA}$							
D1	4	0	0	-24	0	0	0							
D2	4	-0,8	0	0	2,56	0	0							
D3	4	0	0	-24	0	0	0							
G1	4	0	-1	24	0	0	4							
G2	4	-0,8	-1	48	2,56	3,2	4							
S1	3	0	0	-18	0	0	0							
S2	3	-0,6	0	0	1,08	0	0							
S3	3	-0,6	0,75	-36	1,08	-1,35	1,6875							
K1	2,5	0	0	30	0	0	0							
K2	2,5	0	0	30	0	0	0							
K3	2,5	0	0	0	0	0	0							
K4	2,5	1	0	0	2,5	0	0							
K5	2,5	1	0	-30	2,5	0	0							
K6	2,5	0	-1,25	60	0	0	3,90625							
					12,28	1,85								
					δ_{11}	δ_{12}								

Obliczenia metody sił:

Pręt	L/EA	N1	N2	N0	$\frac{N1 \cdot N1 \cdot L}{EA}$	$\frac{N1 \cdot N2 \cdot L}{EA}$	$\frac{N2 \cdot N2 \cdot L}{EA}$							
D1	4	0	0	-24	0	0	0							
D2	4	-0,8	0	0	2,56	0	0							
D3	4	0	0	-24	0	0	0							
G1	4	0	-1	24	0	0	4							
G2	4	-0,8	-1	48	2,56	3,2	4							
S1	3	0	0	-18	0	0	0							
S2	3	-0,6	0	0	1,08	0	0							
S3	3	-0,6	0,75	-36	1,08	-1,35	1,6875							
K1	2,5	0	0	30	0	0	0							
K2	2,5	0	0	30	0	0	0							
K3	2,5	0	0	0	0	0	0							
K4	2,5	1	0	0	2,5	0	0							
K5	2,5	1	0	-30	2,5	0	0							
K6	2,5	0	-1,25	60	0	0	3,90625							
					12,28	1,85	13,594							
					δ_{11}	δ_{12}	δ_{22}							

Obliczenia metody sił:

Pręt	L/EA	N1	N2	N0	$\frac{N1 \cdot N1 \cdot L}{EA}$	$\frac{N1 \cdot N2 \cdot L}{EA}$	$\frac{N2 \cdot N2 \cdot L}{EA}$	$\frac{N1 \cdot N0 \cdot L}{EA}$						
D1	4	0	0	-24	0	0	0							
D2	4	-0,8	0	0	2,56	0	0							
D3	4	0	0	-24	0	0	0							
G1	4	0	-1	24	0	0	4							
G2	4	-0,8	-1	48	2,56	3,2	4							
S1	3	0	0	-18	0	0	0							
S2	3	-0,6	0	0	1,08	0	0							
S3	3	-0,6	0,75	-36	1,08	-1,35	1,6875							
K1	2,5	0	0	30	0	0	0							
K2	2,5	0	0	30	0	0	0							
K3	2,5	0	0	0	0	0	0							
K4	2,5	1	0	0	2,5	0	0							
K5	2,5	1	0	-30	2,5	0	0							
K6	2,5	0	-1,25	60	0	0	3,90625							
					12,28	1,85	13,594							
					δ_{11}	δ_{12}	δ_{22}							

Obliczenia metody sił:

Pręt	L/EA	N1	N2	N0	$\frac{N1 \cdot N1 \cdot L}{EA}$	$\frac{N1 \cdot N2 \cdot L}{EA}$	$\frac{N2 \cdot N2 \cdot L}{EA}$	$\frac{N1 \cdot N0 \cdot L}{EA}$						
D1	4	0	0	-24	0	0	0	0						
D2	4	-0,8	0	0	2,56	0	0	0						
D3	4	0	0	-24	0	0	0	0						
G1	4	0	-1	24	0	0	4	0						
G2	4	-0,8	-1	48	2,56	3,2	4	-153,6						
S1	3	0	0	-18	0	0	0	0						
S2	3	-0,6	0	0	1,08	0	0	0						
S3	3	-0,6	0,75	-36	1,08	-1,35	1,6875	64,8						
K1	2,5	0	0	30	0	0	0	0						
K2	2,5	0	0	30	0	0	0	0						
K3	2,5	0	0	0	0	0	0	0						
K4	2,5	1	0	0	2,5	0	0	0						
K5	2,5	1	0	-30	2,5	0	0	-75						
K6	2,5	0	-1,25	60	0	0	3,90625	0						
					12,28	1,85	13,594							
					δ_{11}	δ_{12}	δ_{22}							

Obliczenia metody sił:

Pręt	L/EA	N1	N2	N0	$\frac{N1 \cdot N1 \cdot L}{EA}$	$\frac{N1 \cdot N2 \cdot L}{EA}$	$\frac{N2 \cdot N2 \cdot L}{EA}$	$\frac{N1 \cdot N0 \cdot L}{EA}$						
D1	4	0	0	-24	0	0	0	0						
D2	4	-0,8	0	0	2,56	0	0	0						
D3	4	0	0	-24	0	0	0	0						
G1	4	0	-1	24	0	0	4	0						
G2	4	-0,8	-1	48	2,56	3,2	4	-153,6						
S1	3	0	0	-18	0	0	0	0						
S2	3	-0,6	0	0	1,08	0	0	0						
S3	3	-0,6	0,75	-36	1,08	-1,35	1,6875	64,8						
K1	2,5	0	0	30	0	0	0	0						
K2	2,5	0	0	30	0	0	0	0						
K3	2,5	0	0	0	0	0	0	0						
K4	2,5	1	0	0	2,5	0	0	0						
K5	2,5	1	0	-30	2,5	0	0	-75						
K6	2,5	0	-1,25	60	0	0	3,90625	0						
					12,28	1,85	13,594	-163,8						
					δ_{11}	δ_{12}	δ_{22}	δ_{10}						

Obliczenia metody sił:

Pręt	L/EA	N1	N2	N0	$\frac{N1 \cdot N1 \cdot L}{EA}$	$\frac{N1 \cdot N2 \cdot L}{EA}$	$\frac{N2 \cdot N2 \cdot L}{EA}$	$\frac{N1 \cdot N0 \cdot L}{EA}$	$\frac{N2 \cdot N0 \cdot L}{EA}$					
D1	4	0	0	-24	0	0	0	0						
D2	4	-0,8	0	0	2,56	0	0	0						
D3	4	0	0	-24	0	0	0	0						
G1	4	0	-1	24	0	0	4	0						
G2	4	-0,8	-1	48	2,56	3,2	4	-153,6						
S1	3	0	0	-18	0	0	0	0						
S2	3	-0,6	0	0	1,08	0	0	0						
S3	3	-0,6	0,75	-36	1,08	-1,35	1,6875	64,8						
K1	2,5	0	0	30	0	0	0	0						
K2	2,5	0	0	30	0	0	0	0						
K3	2,5	0	0	0	0	0	0	0						
K4	2,5	1	0	0	2,5	0	0	0						
K5	2,5	1	0	-30	2,5	0	0	-75						
K6	2,5	0	-1,25	60	0	0	3,90625	0						
					12,28	1,85	13,594	-163,8						
					δ_{11}	δ_{12}	δ_{22}	δ_{10}						

Obliczenia metody sił:

Pręt	L/EA	N1	N2	N0	$\frac{N1 \cdot N1 \cdot L}{EA}$	$\frac{N1 \cdot N2 \cdot L}{EA}$	$\frac{N2 \cdot N2 \cdot L}{EA}$	$\frac{N1 \cdot N0 \cdot L}{EA}$	$\frac{N2 \cdot N0 \cdot L}{EA}$					
D1	4	0	0	-24	0	0	0	0	0					
D2	4	-0,8	0	0	2,56	0	0	0	0					
D3	4	0	0	-24	0	0	0	0	0					
G1	4	0	-1	24	0	0	4	0	-96					
G2	4	-0,8	-1	48	2,56	3,2	4	-153,6	-192					
S1	3	0	0	-18	0	0	0	0	0					
S2	3	-0,6	0	0	1,08	0	0	0	0					
S3	3	-0,6	0,75	-36	1,08	-1,35	1,6875	64,8	-81					
K1	2,5	0	0	30	0	0	0	0	0					
K2	2,5	0	0	30	0	0	0	0	0					
K3	2,5	0	0	0	0	0	0	0	0					
K4	2,5	1	0	0	2,5	0	0	0	0					
K5	2,5	1	0	-30	2,5	0	0	-75	0					
K6	2,5	0	-1,25	60	0	0	3,90625	0	-187,5					
					12,28	1,85	13,594	-163,8						
					δ_{11}	δ_{12}	δ_{22}	δ_{10}						

Obliczenia metody sił:

Pręt	L/EA	N1	N2	N0	$\frac{N1 \cdot N1 \cdot L}{EA}$	$\frac{N1 \cdot N2 \cdot L}{EA}$	$\frac{N2 \cdot N2 \cdot L}{EA}$	$\frac{N1 \cdot N0 \cdot L}{EA}$	$\frac{N2 \cdot N0 \cdot L}{EA}$					
D1	4	0	0	-24	0	0	0	0	0					
D2	4	-0,8	0	0	2,56	0	0	0	0					
D3	4	0	0	-24	0	0	0	0	0					
G1	4	0	-1	24	0	0	4	0	-96					
G2	4	-0,8	-1	48	2,56	3,2	4	-153,6	-192					
S1	3	0	0	-18	0	0	0	0	0					
S2	3	-0,6	0	0	1,08	0	0	0	0					
S3	3	-0,6	0,75	-36	1,08	-1,35	1,6875	64,8	-81					
K1	2,5	0	0	30	0	0	0	0	0					
K2	2,5	0	0	30	0	0	0	0	0					
K3	2,5	0	0	0	0	0	0	0	0					
K4	2,5	1	0	0	2,5	0	0	0	0					
K5	2,5	1	0	-30	2,5	0	0	-75	0					
K6	2,5	0	-1,25	60	0	0	3,90625	0	-187,5					
					12,28	1,85	13,594	-163,8	-556,5					
					δ_{11}	δ_{12}	δ_{22}	δ_{10}	δ_{20}					

Obliczenia metody sił:

Pręt	L/EA	N1	N2	N0	$\frac{N1 \cdot N1 \cdot L}{EA}$	$\frac{N1 \cdot N2 \cdot L}{EA}$	$\frac{N2 \cdot N2 \cdot L}{EA}$	$\frac{N1 \cdot N0 \cdot L}{EA}$	$\frac{N2 \cdot N0 \cdot L}{EA}$					
D1	4	0	0	-24	0	0	0	0	0					
D2	4	-0,8	0	0	2,56	0	0	0	0					
D3	4	0	0	-24	0	0	0	0	0					
G1	4	0	-1	24	0	0	4	0	-96					
G2	4	-0,8	-1	48	2,56	3,2	4	-153,6	-192					
S1	3	0	0	-18	0	0	0	0	0					
S2	3	-0,6	0	0	1,08	0	0	0	0					
S3	3	-0,6	0,75	-36	1,08	-1,35	1,6875	64,8	-81					
K1	2,5	0	0	30	0	0	0	0	0					
K2	2,5	0	0	30	0	0	0	0	0					
K3	2,5	0	0	0	0	0	0	0	0					
K4	2,5	1	0	0	2,5	0	0	0	0					
K5	2,5	1	0	-30	2,5	0	0	-75	0					
K6	2,5	0	-1,25	60	0	0	3,90625	0	-187,5					
					12,28	1,85	13,594	-163,8	-556,5					

Układ równań metody sił:

δ_{11}

δ_{12}

δ_{22}

δ_{10}

δ_{20}

$$\delta_{11} \cdot x_1 + \delta_{12} \cdot x_2 + \delta_{10} = 0$$

$$\delta_{21} \cdot x_1 + \delta_{22} \cdot x_2 + \delta_{20} = 0$$

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Obliczenia metody sił:

Pręt	L/EA	N1	N2	N0	$\frac{N1 \cdot N1 \cdot L}{EA}$	$\frac{N1 \cdot N2 \cdot L}{EA}$	$\frac{N2 \cdot N2 \cdot L}{EA}$	$\frac{N1 \cdot N0 \cdot L}{EA}$	$\frac{N2 \cdot N0 \cdot L}{EA}$					
D1	4	0	0	-24	0	0	0	0	0					
D2	4	-0,8	0	0	2,56	0	0	0	0					
D3	4	0	0	-24	0	0	0	0	0					
G1	4	0	-1	24	0	0	4	0	-96					
G2	4	-0,8	-1	48	2,56	3,2	4	-153,6	-192					
S1	3	0	0	-18	0	0	0	0	0					
S2	3	-0,6	0	0	1,08	0	0	0	0					
S3	3	-0,6	0,75	-36	1,08	-1,35	1,6875	64,8	-81					
K1	2,5	0	0	30	0	0	0	0	0					
K2	2,5	0	0	30	0	0	0	0	0					
K3	2,5	0	0	0	0	0	0	0	0					
K4	2,5	1	0	0	2,5	0	0	0	0					
K5	2,5	1	0	-30	2,5	0	0	-75	0					
K6	2,5	0	-1,25	60	0	0	3,90625	0	-187,5					
					12,28	1,85	13,594	-163,8	-556,5					

Układ równań metody sił:

δ_{11}

δ_{12}

δ_{22}

δ_{10}

δ_{20}

$$\delta_{11} \cdot x_1 + \delta_{12} \cdot x_2 + \delta_{10} = 0$$



$$\delta_{21} \cdot x_1 + \delta_{22} \cdot x_2 + \delta_{20} = 0$$

Obliczenia metody sił:

Pręt	L/EA	N1	N2	N0	$\frac{N1 \cdot N1 \cdot L}{EA}$	$\frac{N1 \cdot N2 \cdot L}{EA}$	$\frac{N2 \cdot N2 \cdot L}{EA}$	$\frac{N1 \cdot N0 \cdot L}{EA}$	$\frac{N2 \cdot N0 \cdot L}{EA}$					
D1	4	0	0	-24	0	0	0	0	0					
D2	4	-0,8	0	0	2,56	0	0	0	0					
D3	4	0	0	-24	0	0	0	0	0					
G1	4	0	-1	24	0	0	4	0	-96					
G2	4	-0,8	-1	48	2,56	3,2	4	-153,6	-192					
S1	3	0	0	-18	0	0	0	0	0					
S2	3	-0,6	0	0	1,08	0	0	0	0					
S3	3	-0,6	0,75	-36	1,08	-1,35	1,6875	64,8	-81					
K1	2,5	0	0	30	0	0	0	0	0					
K2	2,5	0	0	30	0	0	0	0	0					
K3	2,5	0	0	0	0	0	0	0	0					
K4	2,5	1	0	0	2,5	0	0	0	0					
K5	2,5	1	0	-30	2,5	0	0	-75	0					
K6	2,5	0	-1,25	60	0	0	3,90625	0	-187,5					
					12,28	1,85	13,594	-163,8	-556,5					

Układ równań metody sił:

δ_{11}

δ_{12}

δ_{22}

δ_{10}

δ_{20}

$$\delta_{11} \cdot x_1 + \delta_{12} \cdot x_2 + \delta_{10} = 0$$



$$12,28 \cdot x_1 + 1,85 \cdot x_2 - 163,8 = 0$$

$$\delta_{21} \cdot x_1 + \delta_{22} \cdot x_2 + \delta_{20} = 0$$

$$1,85 \cdot x_1 + 13,594 \cdot x_2 - 556,5 = 0$$

Obliczenia metody sił:

Pręt	L/EA	N1	N2	N0	$\frac{N1 \cdot N1 \cdot L}{EA}$	$\frac{N1 \cdot N2 \cdot L}{EA}$	$\frac{N2 \cdot N2 \cdot L}{EA}$	$\frac{N1 \cdot N0 \cdot L}{EA}$	$\frac{N2 \cdot N0 \cdot L}{EA}$					
D1	4	0	0	-24	0	0	0	0	0					
D2	4	-0,8	0	0	2,56	0	0	0	0					
D3	4	0	0	-24	0	0	0	0	0					
G1	4	0	-1	24	0	0	4	0	-96					
G2	4	-0,8	-1	48	2,56	3,2	4	-153,6	-192					
S1	3	0	0	-18	0	0	0	0	0					
S2	3	-0,6	0	0	1,08	0	0	0	0					
S3	3	-0,6	0,75	-36	1,08	-1,35	1,6875	64,8	-81					
K1	2,5	0	0	30	0	0	0	0	0					
K2	2,5	0	0	30	0	0	0	0	0					
K3	2,5	0	0	0	0	0	0	0	0					
K4	2,5	1	0	0	2,5	0	0	0	0					
K5	2,5	1	0	-30	2,5	0	0	-75	0					
K6	2,5	0	-1,25	60	0	0	3,90625	0	-187,5					
					12,28	1,85	13,594	-163,8	-556,5					

Układ równań metody sił:

δ_{11}

δ_{12}

δ_{22}

δ_{10}

δ_{20}

$$\delta_{11} \cdot x_1 + \delta_{12} \cdot x_2 + \delta_{10} = 0$$



$$12,28 \cdot x_1 + 1,85 \cdot x_2 - 163,8 = 0$$



$$\delta_{21} \cdot x_1 + \delta_{22} \cdot x_2 + \delta_{20} = 0$$

$$1,85 \cdot x_1 + 13,594 \cdot x_2 - 556,5 = 0$$

Obliczenia metody sił:

Pręt	L/EA	N1	N2	N0	$\frac{N1 \cdot N1 \cdot L}{EA}$	$\frac{N1 \cdot N2 \cdot L}{EA}$	$\frac{N2 \cdot N2 \cdot L}{EA}$	$\frac{N1 \cdot N0 \cdot L}{EA}$	$\frac{N2 \cdot N0 \cdot L}{EA}$					
D1	4	0	0	-24	0	0	0	0	0					
D2	4	-0,8	0	0	2,56	0	0	0	0					
D3	4	0	0	-24	0	0	0	0	0					
G1	4	0	-1	24	0	0	4	0	-96					
G2	4	-0,8	-1	48	2,56	3,2	4	-153,6	-192					
S1	3	0	0	-18	0	0	0	0	0					
S2	3	-0,6	0	0	1,08	0	0	0	0					
S3	3	-0,6	0,75	-36	1,08	-1,35	1,6875	64,8	-81					
K1	2,5	0	0	30	0	0	0	0	0					
K2	2,5	0	0	30	0	0	0	0	0					
K3	2,5	0	0	0	0	0	0	0	0					
K4	2,5	1	0	0	2,5	0	0	0	0					
K5	2,5	1	0	-30	2,5	0	0	-75	0					
K6	2,5	0	-1,25	60	0	0	3,90625	0	-187,5					
					12,28	1,85	13,594	-163,8	-556,5					

Układ równań metody sił:

$$\delta_{11} \cdot x_1 + \delta_{12} \cdot x_2 + \delta_{10} = 0$$

$$\delta_{21} \cdot x_1 + \delta_{22} \cdot x_2 + \delta_{20} = 0$$



$$12,28 \cdot x_1 + 1,85 \cdot x_2 - 163,8 = 0$$

$$1,85 \cdot x_1 + 13,594 \cdot x_2 - 556,5 = 0$$



$$x_1 = 7,322 \text{ kN}$$

$$x_2 = 39,942 \text{ kN}$$

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Obliczenia metody sił:

Pręt	L/EA	N1	N2	N0	$\frac{N1 \cdot N1 \cdot L}{EA}$	$\frac{N1 \cdot N2 \cdot L}{EA}$	$\frac{N2 \cdot N2 \cdot L}{EA}$	$\frac{N1 \cdot N0 \cdot L}{EA}$	$\frac{N2 \cdot N0 \cdot L}{EA}$	N1*X1				
D1	4	0	0	-24	0	0	0	0	0					
D2	4	-0,8	0	0	2,56	0	0	0	0					
D3	4	0	0	-24	0	0	0	0	0					
G1	4	0	-1	24	0	0	4	0	-96					
G2	4	-0,8	-1	48	2,56	3,2	4	-153,6	-192					
S1	3	0	0	-18	0	0	0	0	0					
S2	3	-0,6	0	0	1,08	0	0	0	0					
S3	3	-0,6	0,75	-36	1,08	-1,35	1,6875	64,8	-81					
K1	2,5	0	0	30	0	0	0	0	0					
K2	2,5	0	0	30	0	0	0	0	0					
K3	2,5	0	0	0	0	0	0	0	0					
K4	2,5	1	0	0	2,5	0	0	0	0					
K5	2,5	1	0	-30	2,5	0	0	-75	0					
K6	2,5	0	-1,25	60	0	0	3,90625	0	-187,5					
					12,28	1,85	13,594	-163,8	-556,5					

Układ równań metody sił:

$$\delta_{11} \cdot x_1 + \delta_{12} \cdot x_2 + \delta_{10} = 0$$

$$\delta_{21} \cdot x_1 + \delta_{22} \cdot x_2 + \delta_{20} = 0$$



$$12,28 \cdot x_1 + 1,85 \cdot x_2 - 163,8 = 0$$

$$1,85 \cdot x_1 + 13,594 \cdot x_2 - 556,5 = 0$$



$$x_1 = 7,322 \text{ kN}$$

$$x_2 = 39,942 \text{ kN}$$

dr inż. Hanna Weber

Obliczenia metody sił:

Pręt	L/EA	N1	N2	N0	$\frac{N1 \cdot N1 \cdot L}{EA}$	$\frac{N1 \cdot N2 \cdot L}{EA}$	$\frac{N2 \cdot N2 \cdot L}{EA}$	$\frac{N1 \cdot N0 \cdot L}{EA}$	$\frac{N2 \cdot N0 \cdot L}{EA}$	$N1 \cdot X1$				
D1	4	0	0	-24	0	0	0	0	0	0,000				
D2	4	-0,8	0	0	2,56	0	0	0	0	-5,857				
D3	4	0	0	-24	0	0	0	0	0	0,000				
G1	4	0	-1	24	0	0	4	0	-96	0,000				
G2	4	-0,8	-1	48	2,56	3,2	4	-153,6	-192	-5,857				
S1	3	0	0	-18	0	0	0	0	0	0,000				
S2	3	-0,6	0	0	1,08	0	0	0	0	-4,393				
S3	3	-0,6	0,75	-36	1,08	-1,35	1,6875	64,8	-81	-4,393				
K1	2,5	0	0	30	0	0	0	0	0	0,000				
K2	2,5	0	0	30	0	0	0	0	0	0,000				
K3	2,5	0	0	0	0	0	0	0	0	0,000				
K4	2,5	1	0	0	2,5	0	0	0	0	7,322				
K5	2,5	1	0	-30	2,5	0	0	-75	0	7,322				
K6	2,5	0	-1,25	60	0	0	3,90625	0	-187,5	0,000				
					12,28	1,85	13,594	-163,8	-556,5					

Układ równań metody sił:

$$\delta_{11} \cdot x1 + \delta_{12} \cdot x2 + \delta_{10} = 0$$

$$\delta_{21} \cdot x1 + \delta_{22} \cdot x2 + \delta_{20} = 0$$



$$12,28 \cdot x1 + 1,85 \cdot x2 - 163,8 = 0$$

$$1,85 \cdot x1 + 13,594 \cdot x2 - 556,5 = 0$$



$$x1 = 7,322 \text{ kN}$$

$$x2 = 39,942 \text{ kN}$$

Obliczenia metody sił:

Pręt	L/EA	N1	N2	N0	$\frac{N1 \cdot N1 \cdot L}{EA}$	$\frac{N1 \cdot N2 \cdot L}{EA}$	$\frac{N2 \cdot N2 \cdot L}{EA}$	$\frac{N1 \cdot N0 \cdot L}{EA}$	$\frac{N2 \cdot N0 \cdot L}{EA}$	N1*X1	N2*X2			
D1	4	0	0	-24	0	0	0	0	0	0,000				
D2	4	-0,8	0	0	2,56	0	0	0	0	-5,857				
D3	4	0	0	-24	0	0	0	0	0	0,000				
G1	4	0	-1	24	0	0	4	0	-96	0,000				
G2	4	-0,8	-1	48	2,56	3,2	4	-153,6	-192	-5,857				
S1	3	0	0	-18	0	0	0	0	0	0,000				
S2	3	-0,6	0	0	1,08	0	0	0	0	-4,393				
S3	3	-0,6	0,75	-36	1,08	-1,35	1,6875	64,8	-81	-4,393				
K1	2,5	0	0	30	0	0	0	0	0	0,000				
K2	2,5	0	0	30	0	0	0	0	0	0,000				
K3	2,5	0	0	0	0	0	0	0	0	0,000				
K4	2,5	1	0	0	2,5	0	0	0	0	7,322				
K5	2,5	1	0	-30	2,5	0	0	-75	0	7,322				
K6	2,5	0	-1,25	60	0	0	3,90625	0	-187,5	0,000				
					12,28	1,85	13,594	-163,8	-556,5					

Układ równań metody sił:

$$\delta_{11} \cdot x_1 + \delta_{12} \cdot x_2 + \delta_{10} = 0$$

$$\delta_{21} \cdot x_1 + \delta_{22} \cdot x_2 + \delta_{20} = 0$$



$$12,28 \cdot x_1 + 1,85 \cdot x_2 - 163,8 = 0$$

$$1,85 \cdot x_1 + 13,594 \cdot x_2 - 556,5 = 0$$



$$x_1 = 7,322 \text{ kN}$$

$$x_2 = 39,942 \text{ kN}$$

dr inż. Hanna Weber

Obliczenia metody sił:

Pręt	L/EA	N1	N2	N0	$\frac{N1 \cdot N1 \cdot L}{EA}$	$\frac{N1 \cdot N2 \cdot L}{EA}$	$\frac{N2 \cdot N2 \cdot L}{EA}$	$\frac{N1 \cdot N0 \cdot L}{EA}$	$\frac{N2 \cdot N0 \cdot L}{EA}$	N1*X1	N2*X2			
D1	4	0	0	-24	0	0	0	0	0	0,000	0,000			
D2	4	-0,8	0	0	2,56	0	0	0	0	-5,857	0,000			
D3	4	0	0	-24	0	0	0	0	0	0,000	0,000			
G1	4	0	-1	24	0	0	4	0	-96	0,000	-39,942			
G2	4	-0,8	-1	48	2,56	3,2	4	-153,6	-192	-5,857	-39,942			
S1	3	0	0	-18	0	0	0	0	0	0,000	0,000			
S2	3	-0,6	0	0	1,08	0	0	0	0	-4,393	0,000			
S3	3	-0,6	0,75	-36	1,08	-1,35	1,6875	64,8	-81	-4,393	29,956			
K1	2,5	0	0	30	0	0	0	0	0	0,000	0,000			
K2	2,5	0	0	30	0	0	0	0	0	0,000	0,000			
K3	2,5	0	0	0	0	0	0	0	0	0,000	0,000			
K4	2,5	1	0	0	2,5	0	0	0	0	7,322	0,000			
K5	2,5	1	0	-30	2,5	0	0	-75	0	7,322	0,000			
K6	2,5	0	-1,25	60	0	0	3,90625	0	-187,5	0,000	-49,927			
					12,28	1,85	13,594	-163,8	-556,5					

Układ równań metody sił:

$$\delta_{11} \cdot x_1 + \delta_{12} \cdot x_2 + \delta_{10} = 0$$

$$\delta_{21} \cdot x_1 + \delta_{22} \cdot x_2 + \delta_{20} = 0$$



$$12,28 \cdot x_1 + 1,85 \cdot x_2 - 163,8 = 0$$

$$1,85 \cdot x_1 + 13,594 \cdot x_2 - 556,5 = 0$$



$$x_1 = 7,322 \text{ kN}$$

$$x_2 = 39,942 \text{ kN}$$

dr inż. Hanna Weber

Obliczenia metody sił:

$$N = N1 \cdot x1 + N2 \cdot x2 + N0$$

Pręt	L/EA	N1	N2	N0	$\frac{N1 \cdot N1 \cdot L}{EA}$	$\frac{N1 \cdot N2 \cdot L}{EA}$	$\frac{N2 \cdot N2 \cdot L}{EA}$	$\frac{N1 \cdot N0 \cdot L}{EA}$	$\frac{N2 \cdot N0 \cdot L}{EA}$	N1*x1	N2*x2	N		
D1	4	0	0	-24	0	0	0	0	0	0,000	0,000			
D2	4	-0,8	0	0	2,56	0	0	0	0	-5,857	0,000			
D3	4	0	0	-24	0	0	0	0	0	0,000	0,000			
G1	4	0	-1	24	0	0	4	0	-96	0,000	-39,942			
G2	4	-0,8	-1	48	2,56	3,2	4	-153,6	-192	-5,857	-39,942			
S1	3	0	0	-18	0	0	0	0	0	0,000	0,000			
S2	3	-0,6	0	0	1,08	0	0	0	0	-4,393	0,000			
S3	3	-0,6	0,75	-36	1,08	-1,35	1,6875	64,8	-81	-4,393	29,956			
K1	2,5	0	0	30	0	0	0	0	0	0,000	0,000			
K2	2,5	0	0	30	0	0	0	0	0	0,000	0,000			
K3	2,5	0	0	0	0	0	0	0	0	0,000	0,000			
K4	2,5	1	0	0	2,5	0	0	0	0	7,322	0,000			
K5	2,5	1	0	-30	2,5	0	0	-75	0	7,322	0,000			
K6	2,5	0	-1,25	60	0	0	3,90625	0	-187,5	0,000	-49,927			
					12,28	1,85	13,594	-163,8	-556,5					

Układ równań metody sił:

$$\delta_{11} \cdot x1 + \delta_{12} \cdot x2 + \delta_{10} = 0$$

$$\delta_{21} \cdot x1 + \delta_{22} \cdot x2 + \delta_{20} = 0$$



$$12,28 \cdot x1 + 1,85 \cdot x2 - 163,8 = 0$$

$$1,85 \cdot x1 + 13,594 \cdot x2 - 556,5 = 0$$



$$x1 = 7,322 \text{ kN}$$

$$x2 = 39,942 \text{ kN}$$

dr inż. Hanna Weber

Obliczenia metody sił:

$$N = N1 \cdot x1 + N2 \cdot x2 + N0$$

Pręt	L/EA	N1	N2	N0	$\frac{N1 \cdot N1 \cdot L}{EA}$	$\frac{N1 \cdot N2 \cdot L}{EA}$	$\frac{N2 \cdot N2 \cdot L}{EA}$	$\frac{N1 \cdot N0 \cdot L}{EA}$	$\frac{N2 \cdot N0 \cdot L}{EA}$	N1*x1	N2*x2	N		
D1	4	0	0	-24	0	0	0	0	0	0,000	0,000	-24,000		
D2	4	-0,8	0	0	2,56	0	0	0	0	-5,857	0,000	-5,857		
D3	4	0	0	-24	0	0	0	0	0	0,000	0,000	-24,000		
G1	4	0	-1	24	0	0	4	0	-96	0,000	-39,942	-15,942		
G2	4	-0,8	-1	48	2,56	3,2	4	-153,6	-192	-5,857	-39,942	2,201		
S1	3	0	0	-18	0	0	0	0	0	0,000	0,000	-18,000		
S2	3	-0,6	0	0	1,08	0	0	0	0	-4,393	0,000	-4,393		
S3	3	-0,6	0,75	-36	1,08	-1,35	1,6875	64,8	-81	-4,393	29,956	-10,437		
K1	2,5	0	0	30	0	0	0	0	0	0,000	0,000	30,000		
K2	2,5	0	0	30	0	0	0	0	0	0,000	0,000	30,000		
K3	2,5	0	0	0	0	0	0	0	0	0,000	0,000	0,000		
K4	2,5	1	0	0	2,5	0	0	0	0	7,322	0,000	7,322		
K5	2,5	1	0	-30	2,5	0	0	-75	0	7,322	0,000	-22,678		
K6	2,5	0	-1,25	60	0	0	3,90625	0	-187,5	0,000	-49,927	10,073		
					12,28	1,85	13,594	-163,8	-556,5					

Układ równań metody sił:

$$\delta_{11} \cdot x1 + \delta_{12} \cdot x2 + \delta_{10} = 0$$

$$\delta_{21} \cdot x1 + \delta_{22} \cdot x2 + \delta_{20} = 0$$



$$12,28 \cdot x1 + 1,85 \cdot x2 - 163,8 = 0$$

$$1,85 \cdot x1 + 13,594 \cdot x2 - 556,5 = 0$$



$$x1 = 7,322 \text{ kN}$$

$$x2 = 39,942 \text{ kN}$$

dr inż. Hanna Weber

Obliczenia metody sił:

Sprawdzenie z twierdzenia redukcyjnego:

Pręt	L/EA	N1	N2	N0	$\frac{N1 \cdot N1 \cdot L}{EA}$	$\frac{N1 \cdot N2 \cdot L}{EA}$	$\frac{N2 \cdot N2 \cdot L}{EA}$	$\frac{N1 \cdot N0 \cdot L}{EA}$	$\frac{N2 \cdot N0 \cdot L}{EA}$	N1*X1	N2*X2	N	$\frac{N1 \cdot N \cdot L}{EA}$	
D1	4	0	0	-24	0	0	0	0	0	0,000	0,000	-24,000		
D2	4	-0,8	0	0	2,56	0	0	0	0	-5,857	0,000	-5,857		
D3	4	0	0	-24	0	0	0	0	0	0,000	0,000	-24,000		
G1	4	0	-1	24	0	0	4	0	-96	0,000	-39,942	-15,942		
G2	4	-0,8	-1	48	2,56	3,2	4	-153,6	-192	-5,857	-39,942	2,201		
S1	3	0	0	-18	0	0	0	0	0	0,000	0,000	-18,000		
S2	3	-0,6	0	0	1,08	0	0	0	0	-4,393	0,000	-4,393		
S3	3	-0,6	0,75	-36	1,08	-1,35	1,6875	64,8	-81	-4,393	29,956	-10,437		
K1	2,5	0	0	30	0	0	0	0	0	0,000	0,000	30,000		
K2	2,5	0	0	30	0	0	0	0	0	0,000	0,000	30,000		
K3	2,5	0	0	0	0	0	0	0	0	0,000	0,000	0,000		
K4	2,5	1	0	0	2,5	0	0	0	0	7,322	0,000	7,322		
K5	2,5	1	0	-30	2,5	0	0	-75	0	7,322	0,000	-22,678		
K6	2,5	0	-1,25	60	0	0	3,90625	0	-187,5	0,000	-49,927	10,073		
					12,28	1,85	13,594	-163,8	-556,5					

Układ równań metody sił:

δ_{11}

δ_{12}

δ_{22}

δ_{10}

δ_{20}

$$\delta_{11} \cdot x_1 + \delta_{12} \cdot x_2 + \delta_{10} = 0$$



$$12,28 \cdot x_1 + 1,85 \cdot x_2 - 163,8 = 0$$



$$x_1 = 7,322 \text{ kN}$$

$$\delta_{21} \cdot x_1 + \delta_{22} \cdot x_2 + \delta_{20} = 0$$

$$1,85 \cdot x_1 + 13,594 \cdot x_2 - 556,5 = 0$$

$$x_2 = 39,942 \text{ kN}$$

dr inż. Hanna Weber

Obliczenia metody sił:

Sprawdzenie z twierdzenia redukcyjnego:

Pręt	L/EA	N1	N2	N0	$\frac{N1 \cdot N1 \cdot L}{EA}$	$\frac{N1 \cdot N2 \cdot L}{EA}$	$\frac{N2 \cdot N2 \cdot L}{EA}$	$\frac{N1 \cdot N0 \cdot L}{EA}$	$\frac{N2 \cdot N0 \cdot L}{EA}$	N1*X1	N2*X2	N	$\frac{N1 \cdot N \cdot L}{EA}$	
D1	4	0	0	-24	0	0	0	0	0	0,000	0,000	-24,000	0,000	
D2	4	-0,8	0	0	2,56	0	0	0	0	-5,857	0,000	-5,857	18,743	
D3	4	0	0	-24	0	0	0	0	0	0,000	0,000	-24,000	0,000	
G1	4	0	-1	24	0	0	4	0	-96	0,000	-39,942	-15,942	0,000	
G2	4	-0,8	-1	48	2,56	3,2	4	-153,6	-192	-5,857	-39,942	2,201	-7,044	
S1	3	0	0	-18	0	0	0	0	0	0,000	0,000	-18,000	0,000	
S2	3	-0,6	0	0	1,08	0	0	0	0	-4,393	0,000	-4,393	7,907	
S3	3	-0,6	0,75	-36	1,08	-1,35	1,6875	64,8	-81	-4,393	29,956	-10,437	18,786	
K1	2,5	0	0	30	0	0	0	0	0	0,000	0,000	30,000	0,000	
K2	2,5	0	0	30	0	0	0	0	0	0,000	0,000	30,000	0,000	
K3	2,5	0	0	0	0	0	0	0	0	0,000	0,000	0,000	0,000	
K4	2,5	1	0	0	2,5	0	0	0	0	7,322	0,000	7,322	18,304	
K5	2,5	1	0	-30	2,5	0	0	-75	0	7,322	0,000	-22,678	-56,696	
K6	2,5	0	-1,25	60	0	0	3,90625	0	-187,5	0,000	-49,927	10,073	0,000	
					12,28	1,85	13,594	-163,8	-556,5					

Układ równań metody sił:

δ_{11}

δ_{12}

δ_{22}

δ_{10}

δ_{20}

$$\delta_{11} \cdot x_1 + \delta_{12} \cdot x_2 + \delta_{10} = 0$$



$$12,28 \cdot x_1 + 1,85 \cdot x_2 - 163,8 = 0$$



$$x_1 = 7,322 \text{ kN}$$

$$\delta_{21} \cdot x_1 + \delta_{22} \cdot x_2 + \delta_{20} = 0$$

$$1,85 \cdot x_1 + 13,594 \cdot x_2 - 556,5 = 0$$

$$x_2 = 39,942 \text{ kN}$$

dr inż. Hanna Weber

Obliczenia metody sił:

Sprawdzenie z twierdzenia redukcyjnego:

Pręt	L/EA	N1	N2	N0	$\frac{N1 \cdot N1 \cdot L}{EA}$	$\frac{N1 \cdot N2 \cdot L}{EA}$	$\frac{N2 \cdot N2 \cdot L}{EA}$	$\frac{N1 \cdot N0 \cdot L}{EA}$	$\frac{N2 \cdot N0 \cdot L}{EA}$	N1*X1	N2*X2	N	$\frac{N1 \cdot N \cdot L}{EA}$	
D1	4	0	0	-24	0	0	0	0	0	0,000	0,000	-24,000	0,000	
D2	4	-0,8	0	0	2,56	0	0	0	0	-5,857	0,000	-5,857	18,743	
D3	4	0	0	-24	0	0	0	0	0	0,000	0,000	-24,000	0,000	
G1	4	0	-1	24	0	0	4	0	-96	0,000	-39,942	-15,942	0,000	
G2	4	-0,8	-1	48	2,56	3,2	4	-153,6	-192	-5,857	-39,942	2,201	-7,044	
S1	3	0	0	-18	0	0	0	0	0	0,000	0,000	-18,000	0,000	
S2	3	-0,6	0	0	1,08	0	0	0	0	-4,393	0,000	-4,393	7,907	
S3	3	-0,6	0,75	-36	1,08	-1,35	1,6875	64,8	-81	-4,393	29,956	-10,437	18,786	
K1	2,5	0	0	30	0	0	0	0	0	0,000	0,000	30,000	0,000	
K2	2,5	0	0	30	0	0	0	0	0	0,000	0,000	30,000	0,000	
K3	2,5	0	0	0	0	0	0	0	0	0,000	0,000	0,000	0,000	
K4	2,5	1	0	0	2,5	0	0	0	0	7,322	0,000	7,322	18,304	
K5	2,5	1	0	-30	2,5	0	0	-75	0	7,322	0,000	-22,678	-56,696	
K6	2,5	0	-1,25	60	0	0	3,90625	0	-187,5	0,000	-49,927	10,073	0,000	
					12,28	1,85	13,594	-163,8	-556,5					0,000

Układ równań metody sił:

δ_{11}

δ_{12}

δ_{22}

δ_{10}

δ_{20}

$$\delta_{11} \cdot x_1 + \delta_{12} \cdot x_2 + \delta_{10} = 0$$



$$12,28 \cdot x_1 + 1,85 \cdot x_2 - 163,8 = 0$$



$$x_1 = 7,322 \text{ kN}$$

$$\delta_{21} \cdot x_1 + \delta_{22} \cdot x_2 + \delta_{20} = 0$$

$$1,85 \cdot x_1 + 13,594 \cdot x_2 - 556,5 = 0$$

$$x_2 = 39,942 \text{ kN}$$

dr inż. Hanna Weber

Obliczenia metody sił:

Sprawdzenie z twierdzenia redukcyjnego:

Pręt	L/EA	N1	N2	N0	$\frac{N1 \cdot N1 \cdot L}{EA}$	$\frac{N1 \cdot N2 \cdot L}{EA}$	$\frac{N2 \cdot N2 \cdot L}{EA}$	$\frac{N1 \cdot N0 \cdot L}{EA}$	$\frac{N2 \cdot N0 \cdot L}{EA}$	N1*X1	N2*X2	N	$\frac{N1 \cdot N \cdot L}{EA}$	$\frac{N2 \cdot N \cdot L}{EA}$
D1	4	0	0	-24	0	0	0	0	0	0,000	0,000	-24,000	0,000	
D2	4	-0,8	0	0	2,56	0	0	0	0	-5,857	0,000	-5,857	18,743	
D3	4	0	0	-24	0	0	0	0	0	0,000	0,000	-24,000	0,000	
G1	4	0	-1	24	0	0	4	0	-96	0,000	-39,942	-15,942	0,000	
G2	4	-0,8	-1	48	2,56	3,2	4	-153,6	-192	-5,857	-39,942	2,201	-7,044	
S1	3	0	0	-18	0	0	0	0	0	0,000	0,000	-18,000	0,000	
S2	3	-0,6	0	0	1,08	0	0	0	0	-4,393	0,000	-4,393	7,907	
S3	3	-0,6	0,75	-36	1,08	-1,35	1,6875	64,8	-81	-4,393	29,956	-10,437	18,786	
K1	2,5	0	0	30	0	0	0	0	0	0,000	0,000	30,000	0,000	
K2	2,5	0	0	30	0	0	0	0	0	0,000	0,000	30,000	0,000	
K3	2,5	0	0	0	0	0	0	0	0	0,000	0,000	0,000	0,000	
K4	2,5	1	0	0	2,5	0	0	0	0	7,322	0,000	7,322	18,304	
K5	2,5	1	0	-30	2,5	0	0	-75	0	7,322	0,000	-22,678	-56,696	
K6	2,5	0	-1,25	60	0	0	3,90625	0	-187,5	0,000	-49,927	10,073	0,000	
					12,28	1,85	13,594	-163,8	-556,5				0,000	

Układ równań metody sił:

δ_{11}

δ_{12}

δ_{22}

δ_{10}

δ_{20}

$$\delta_{11} \cdot x_1 + \delta_{12} \cdot x_2 + \delta_{10} = 0$$



$$12,28 \cdot x_1 + 1,85 \cdot x_2 - 163,8 = 0$$



$$x_1 = 7,322 \text{ kN}$$

$$\delta_{21} \cdot x_1 + \delta_{22} \cdot x_2 + \delta_{20} = 0$$

$$1,85 \cdot x_1 + 13,594 \cdot x_2 - 556,5 = 0$$

$$x_2 = 39,942 \text{ kN}$$

dr inż. Hanna Weber

Obliczenia metody sił:

Sprawdzenie z twierdzenia redukcyjnego:

Pręt	L/EA	N1	N2	N0	$\frac{N1 \cdot N1 \cdot L}{EA}$	$\frac{N1 \cdot N2 \cdot L}{EA}$	$\frac{N2 \cdot N2 \cdot L}{EA}$	$\frac{N1 \cdot N0 \cdot L}{EA}$	$\frac{N2 \cdot N0 \cdot L}{EA}$	N1*X1	N2*X2	N	$\frac{N1 \cdot N \cdot L}{EA}$	$\frac{N2 \cdot N \cdot L}{EA}$
D1	4	0	0	-24	0	0	0	0	0	0,000	0,000	-24,000	0,000	0,000
D2	4	-0,8	0	0	2,56	0	0	0	0	-5,857	0,000	-5,857	18,743	0,000
D3	4	0	0	-24	0	0	0	0	0	0,000	0,000	-24,000	0,000	0,000
G1	4	0	-1	24	0	0	4	0	-96	0,000	-39,942	-15,942	0,000	63,766
G2	4	-0,8	-1	48	2,56	3,2	4	-153,6	-192	-5,857	-39,942	2,201	-7,044	-8,805
S1	3	0	0	-18	0	0	0	0	0	0,000	0,000	-18,000	0,000	0,000
S2	3	-0,6	0	0	1,08	0	0	0	0	-4,393	0,000	-4,393	7,907	0,000
S3	3	-0,6	0,75	-36	1,08	-1,35	1,6875	64,8	-81	-4,393	29,956	-10,437	18,786	-23,483
K1	2,5	0	0	30	0	0	0	0	0	0,000	0,000	30,000	0,000	0,000
K2	2,5	0	0	30	0	0	0	0	0	0,000	0,000	30,000	0,000	0,000
K3	2,5	0	0	0	0	0	0	0	0	0,000	0,000	0,000	0,000	0,000
K4	2,5	1	0	0	2,5	0	0	0	0	7,322	0,000	7,322	18,304	0,000
K5	2,5	1	0	-30	2,5	0	0	-75	0	7,322	0,000	-22,678	-56,696	0,000
K6	2,5	0	-1,25	60	0	0	3,90625	0	-187,5	0,000	-49,927	10,073	0,000	-31,478
					12,28	1,85	13,594	-163,8	-556,5				0,000	

Układ równań metody sił:

δ_{11}

δ_{12}

δ_{22}

δ_{10}

δ_{20}

$$\delta_{11} \cdot x_1 + \delta_{12} \cdot x_2 + \delta_{10} = 0$$



$$12,28 \cdot x_1 + 1,85 \cdot x_2 - 163,8 = 0$$



$$x_1 = 7,322 \text{ kN}$$

$$\delta_{21} \cdot x_1 + \delta_{22} \cdot x_2 + \delta_{20} = 0$$

$$1,85 \cdot x_1 + 13,594 \cdot x_2 - 556,5 = 0$$

$$x_2 = 39,942 \text{ kN}$$

dr inż. Hanna Weber

Obliczenia metody sił:

Sprawdzenie z twierdzenia redukcyjnego:

Pręt	L/EA	N1	N2	N0	$\frac{N1 \cdot N1 \cdot L}{EA}$	$\frac{N1 \cdot N2 \cdot L}{EA}$	$\frac{N2 \cdot N2 \cdot L}{EA}$	$\frac{N1 \cdot N0 \cdot L}{EA}$	$\frac{N2 \cdot N0 \cdot L}{EA}$	N1*X1	N2*X2	N	$\frac{N1 \cdot N \cdot L}{EA}$	$\frac{N2 \cdot N \cdot L}{EA}$
D1	4	0	0	-24	0	0	0	0	0	0,000	0,000	-24,000	0,000	0,000
D2	4	-0,8	0	0	2,56	0	0	0	0	-5,857	0,000	-5,857	18,743	0,000
D3	4	0	0	-24	0	0	0	0	0	0,000	0,000	-24,000	0,000	0,000
G1	4	0	-1	24	0	0	4	0	-96	0,000	-39,942	-15,942	0,000	63,766
G2	4	-0,8	-1	48	2,56	3,2	4	-153,6	-192	-5,857	-39,942	2,201	-7,044	-8,805
S1	3	0	0	-18	0	0	0	0	0	0,000	0,000	-18,000	0,000	0,000
S2	3	-0,6	0	0	1,08	0	0	0	0	-4,393	0,000	-4,393	7,907	0,000
S3	3	-0,6	0,75	-36	1,08	-1,35	1,6875	64,8	-81	-4,393	29,956	-10,437	18,786	-23,483
K1	2,5	0	0	30	0	0	0	0	0	0,000	0,000	30,000	0,000	0,000
K2	2,5	0	0	30	0	0	0	0	0	0,000	0,000	30,000	0,000	0,000
K3	2,5	0	0	0	0	0	0	0	0	0,000	0,000	0,000	0,000	0,000
K4	2,5	1	0	0	2,5	0	0	0	0	7,322	0,000	7,322	18,304	0,000
K5	2,5	1	0	-30	2,5	0	0	-75	0	7,322	0,000	-22,678	-56,696	0,000
K6	2,5	0	-1,25	60	0	0	3,90625	0	-187,5	0,000	-49,927	10,073	0,000	-31,478
					12,28	1,85	13,594	-163,8	-556,5				0,000	0,000

Układ równań metody sił:

δ_{11}

δ_{12}

δ_{22}

δ_{10}

δ_{20}

$$\delta_{11} \cdot x_1 + \delta_{12} \cdot x_2 + \delta_{10} = 0$$



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$$\delta_{21} \cdot x_1 + \delta_{22} \cdot x_2 + \delta_{20} = 0$$

$$1,85 \cdot x_1 + 13,594 \cdot x_2 - 556,5 = 0$$

$$x_2 = 39,942 \text{ kN}$$

dr inż. Hanna Weber

Obliczenia metody sił:

Sprawdzenie z twierdzenia redukcyjnego:

Pręt	L/EA	N1	N2	N0	$\frac{N1 \cdot N1 \cdot L}{EA}$	$\frac{N1 \cdot N2 \cdot L}{EA}$	$\frac{N2 \cdot N2 \cdot L}{EA}$	$\frac{N1 \cdot N0 \cdot L}{EA}$	$\frac{N2 \cdot N0 \cdot L}{EA}$	N1*X1	N2*X2	N	$\frac{N1 \cdot N \cdot L}{EA}$	$\frac{N2 \cdot N \cdot L}{EA}$
D1	4	0	0	-24	0	0	0	0	0	0,000	0,000	-24,000	0,000	0,000
D2	4	-0,8	0	0	2,56	0	0	0	0	-5,857	0,000	-5,857	18,743	0,000
D3	4	0	0	-24	0	0	0	0	0	0,000	0,000	-24,000	0,000	0,000
G1	4	0	-1	24	0	0	4	0	-96	0,000	-39,942	-15,942	0,000	63,766
G2	4	-0,8	-1	48	2,56	3,2	4	-153,6	-192	-5,857	-39,942	2,201	-7,044	-8,805
S1	3	0	0	-18	0	0	0	0	0	0,000	0,000	-18,000	0,000	0,000
S2	3	-0,6	0	0	1,08	0	0	0	0	-4,393	0,000	-4,393	7,907	0,000
S3	3	-0,6	0,75	-36	1,08	-1,35	1,6875	64,8	-81	-4,393	29,956	-10,437	18,786	-23,483
K1	2,5	0	0	30	0	0	0	0	0	0,000	0,000	30,000	0,000	0,000
K2	2,5	0	0	30	0	0	0	0	0	0,000	0,000	30,000	0,000	0,000
K3	2,5	0	0	0	0	0	0	0	0	0,000	0,000	0,000	0,000	0,000
K4	2,5	1	0	0	2,5	0	0	0	0	7,322	0,000	7,322	18,304	0,000
K5	2,5	1	0	-30	2,5	0	0	-75	0	7,322	0,000	-22,678	-56,696	0,000
K6	2,5	0	-1,25	60	0	0	3,90625	0	-187,5	0,000	-49,927	10,073	0,000	-31,478
					12,28	1,85	13,594	-163,8	-556,5				0,000	0,000

Układ równań metody sił:

δ_{11}

δ_{12}

δ_{22}

δ_{10}

δ_{20}

$$\delta_{11} \cdot x_1 + \delta_{12} \cdot x_2 + \delta_{10} = 0$$



$$12,28 \cdot x_1 + 1,85 \cdot x_2 - 163,8 = 0$$



$$x_1 = 7,322 \text{ kN}$$

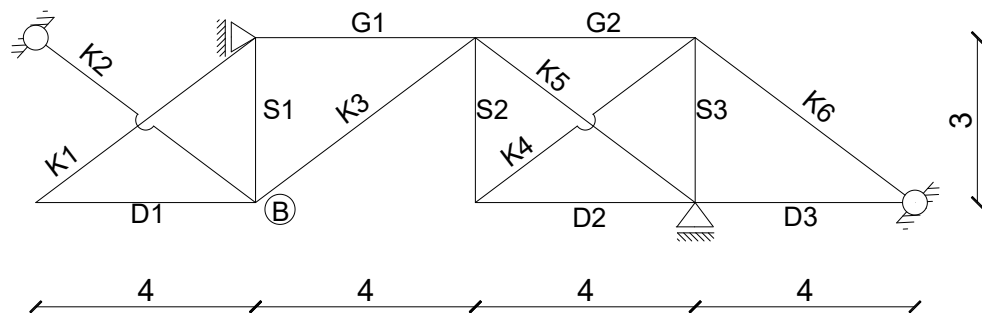
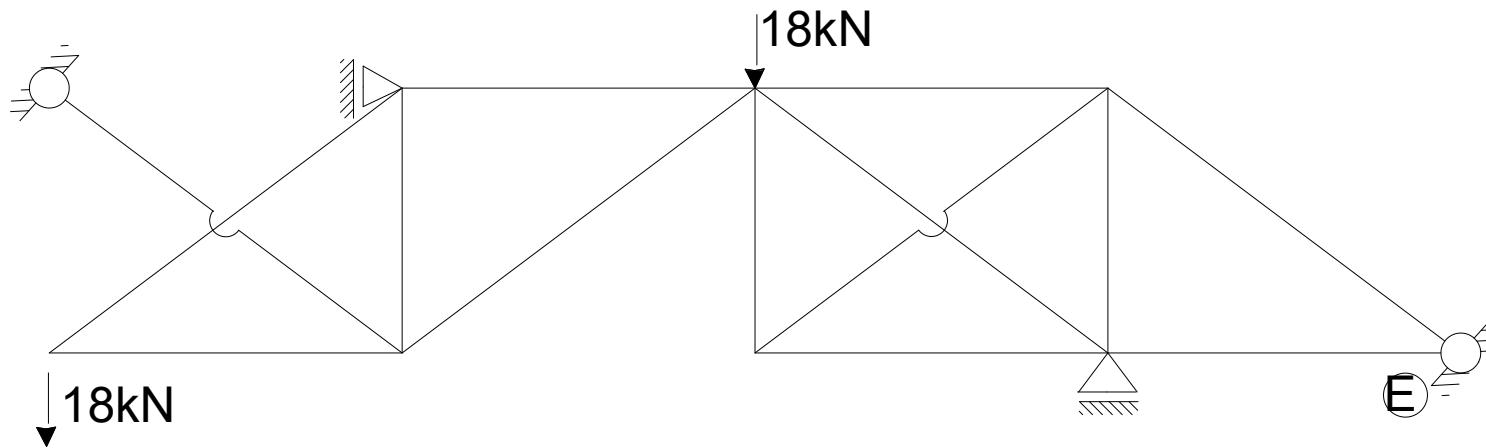
$$\delta_{21} \cdot x_1 + \delta_{22} \cdot x_2 + \delta_{20} = 0$$

$$1,85 \cdot x_1 + 13,594 \cdot x_2 - 556,5 = 0$$

$$x_2 = 39,942 \text{ kN}$$

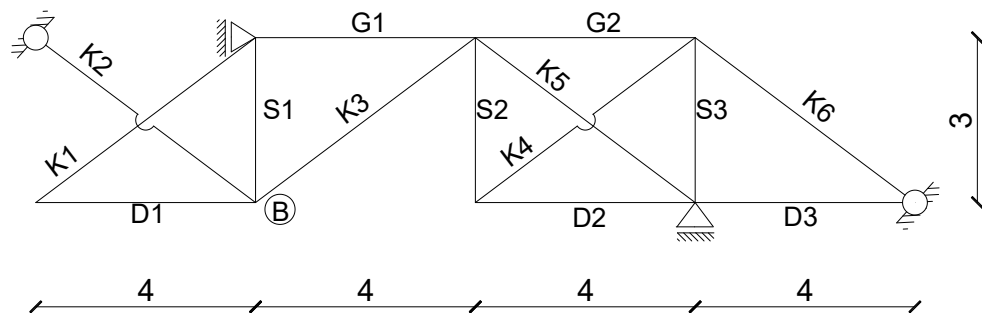
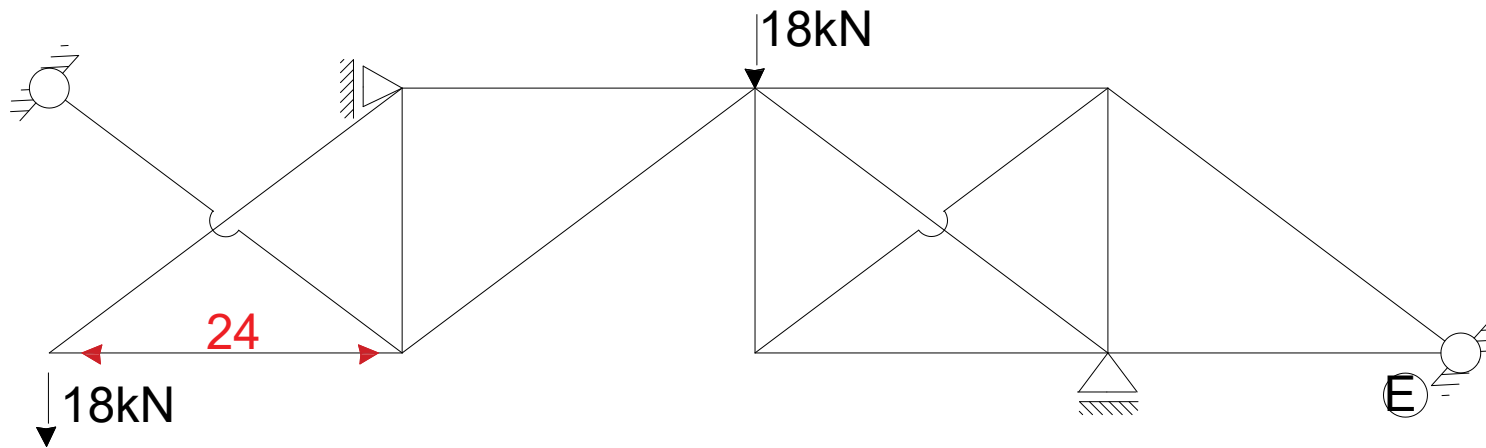
dr inż. Hanna Weber

Końcowy wykres sił normalnych – N [kN]



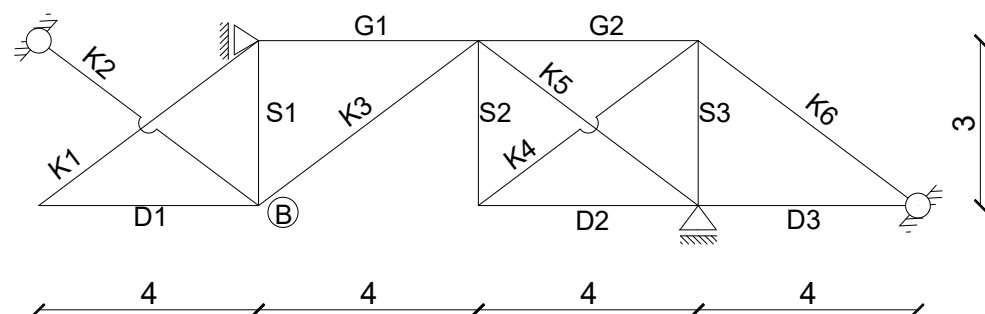
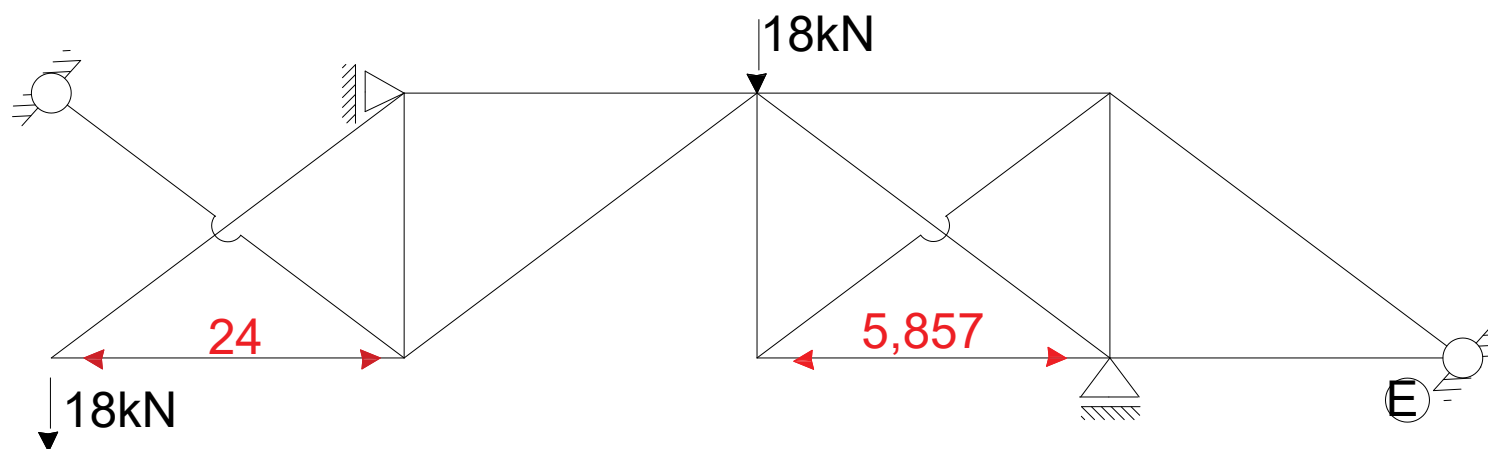
Pręt	L/EA	N
D1	4	-24,000
D2	4	-5,857
D3	4	-24,000
G1	4	-15,942
G2	4	2,201
S1	3	-18,000
S2	3	-4,393
S3	3	-10,437
K1	2,5	30,000
K2	2,5	30,000
K3	2,5	0,000
K4	2,5	7,322
K5	2,5	-22,678
K6	2,5	10,073

Końcowy wykres sił normalnych – N [kN]



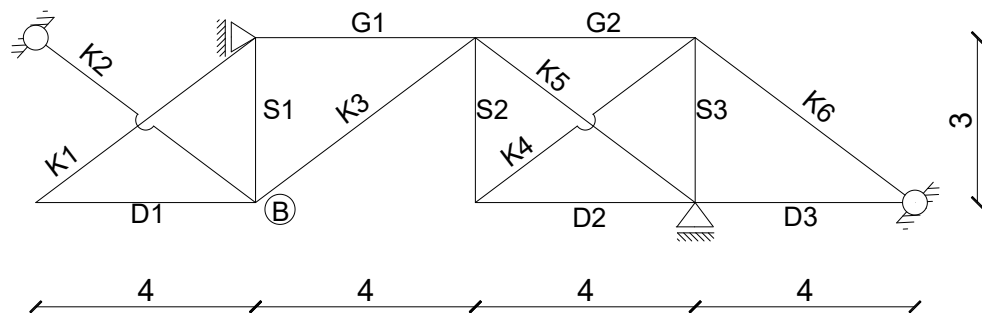
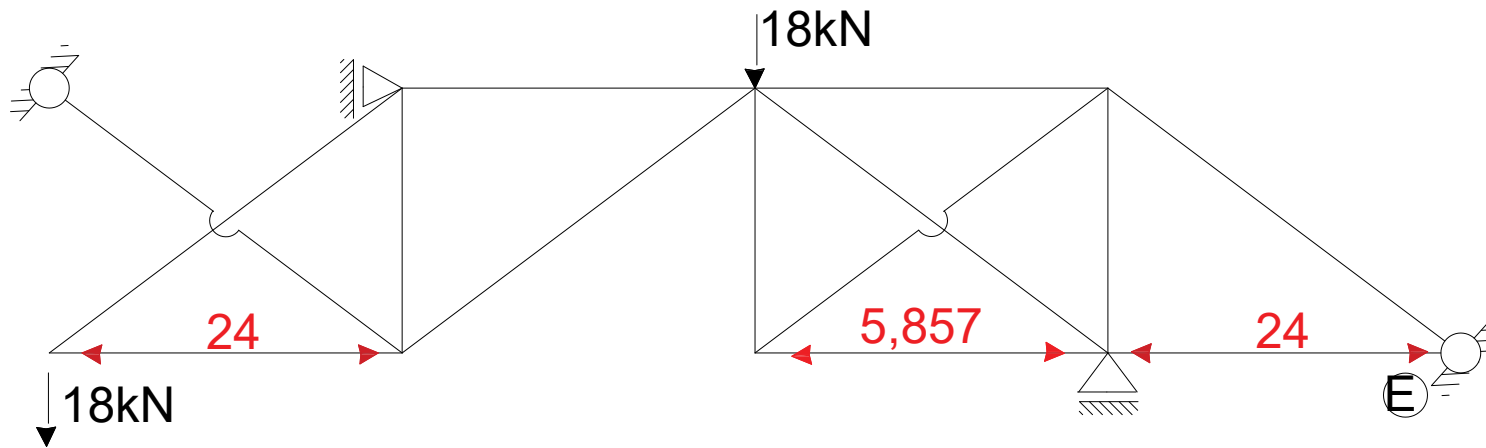
Pręt	L/EA	N
D1	4	-24,000
D2	4	-5,857
D3	4	-24,000
G1	4	-15,942
G2	4	2,201
S1	3	-18,000
S2	3	-4,393
S3	3	-10,437
K1	2,5	30,000
K2	2,5	30,000
K3	2,5	0,000
K4	2,5	7,322
K5	2,5	-22,678
K6	2,5	10,073

Końcowy wykres sił normalnych – N [kN]



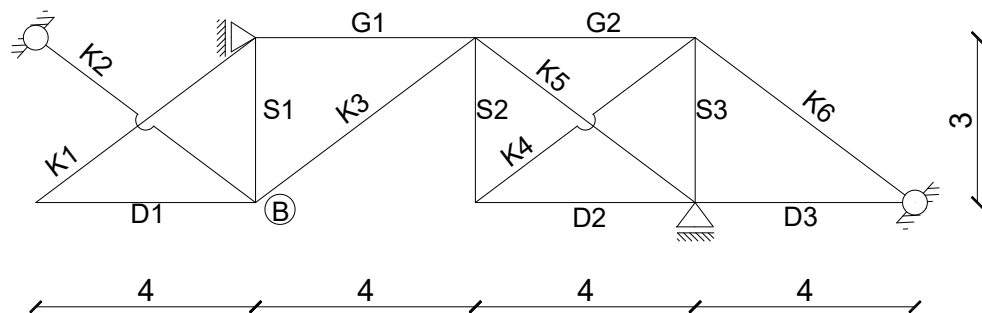
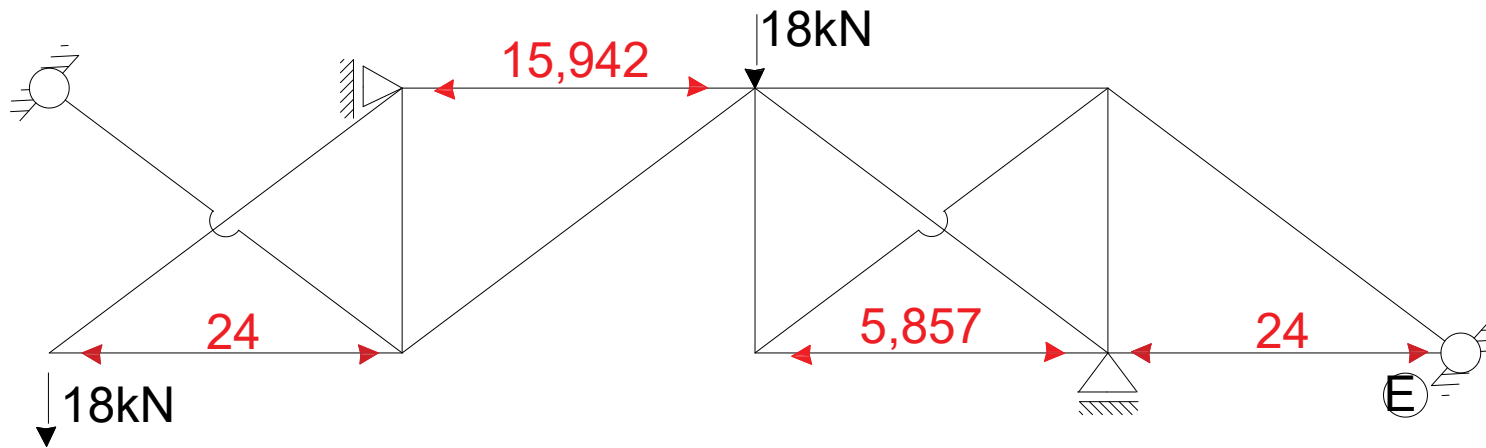
Pręt	L/EA	N
D1	4	-24,000
D2	4	-5,857
D3	4	-24,000
G1	4	-15,942
G2	4	2,201
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S2	3	-4,393
S3	3	-10,437
K1	2,5	30,000
K2	2,5	30,000
K3	2,5	0,000
K4	2,5	7,322
K5	2,5	-22,678
K6	2,5	10,073

Końcowy wykres sił normalnych – N [kN]



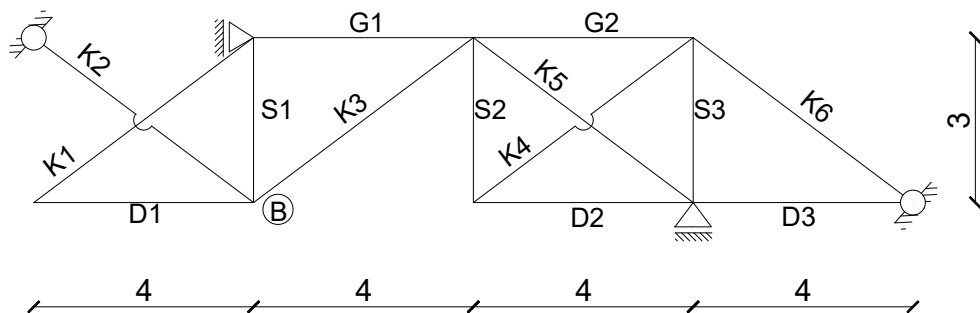
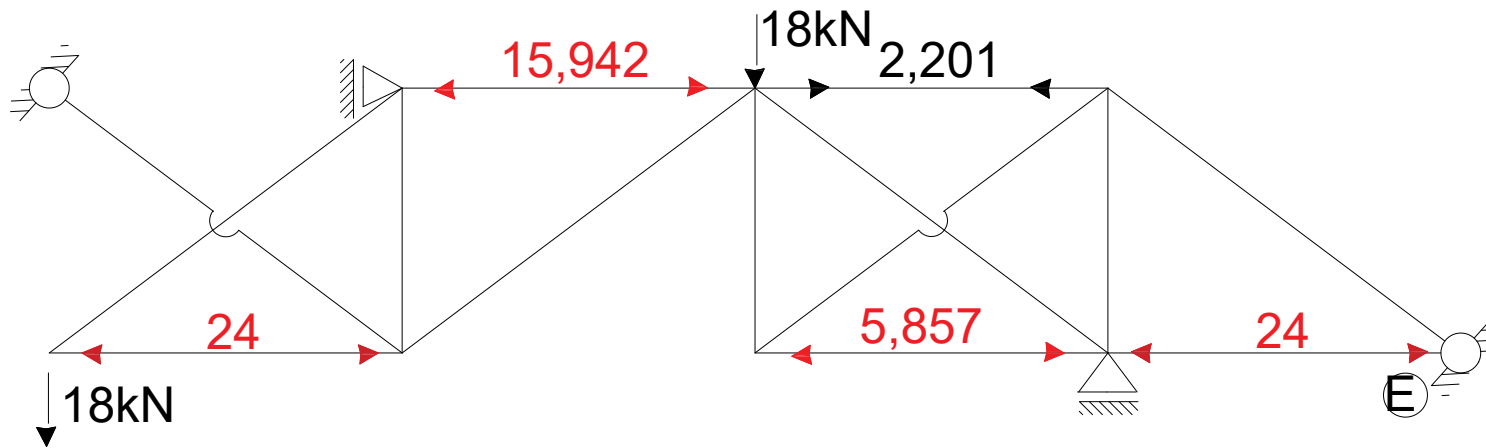
Pręt	L/EA	N
D1	4	-24,000
D2	4	-5,857
D3	4	-24,000
G1	4	-15,942
G2	4	2,201
S1	3	-18,000
S2	3	-4,393
S3	3	-10,437
K1	2,5	30,000
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K6	2,5	10,073

Końcowy wykres sił normalnych – N [kN]



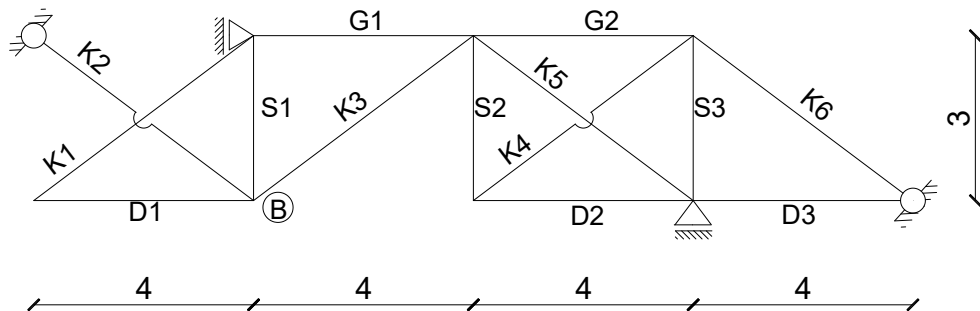
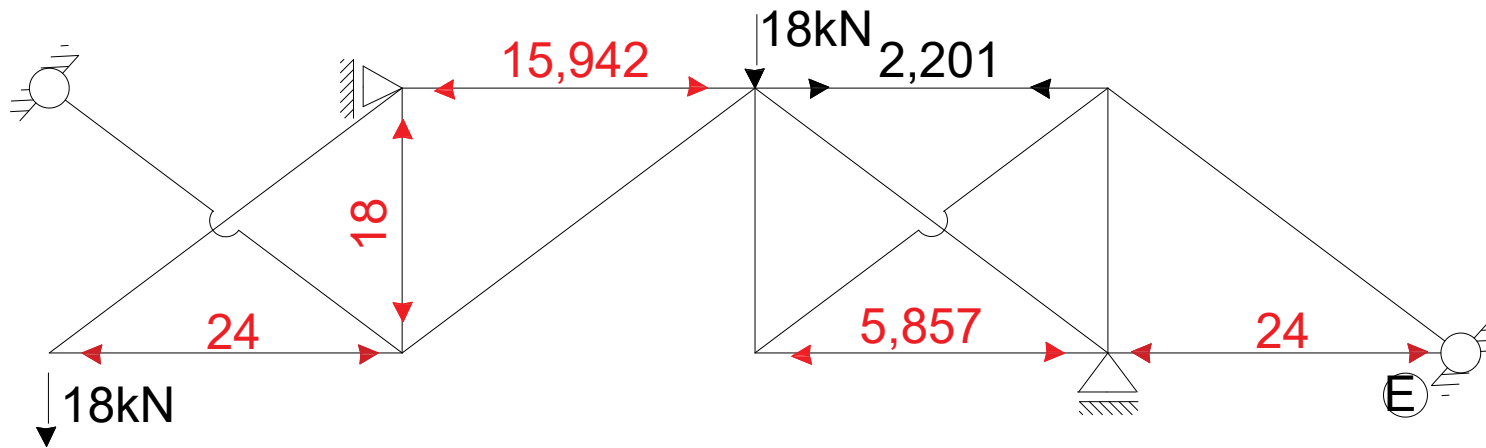
Pręt	L/EA	N
D1	4	-24,000
D2	4	-5,857
D3	4	-24,000
G1	4	-15,942
G2	4	2,201
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Końcowy wykres sił normalnych – N [kN]



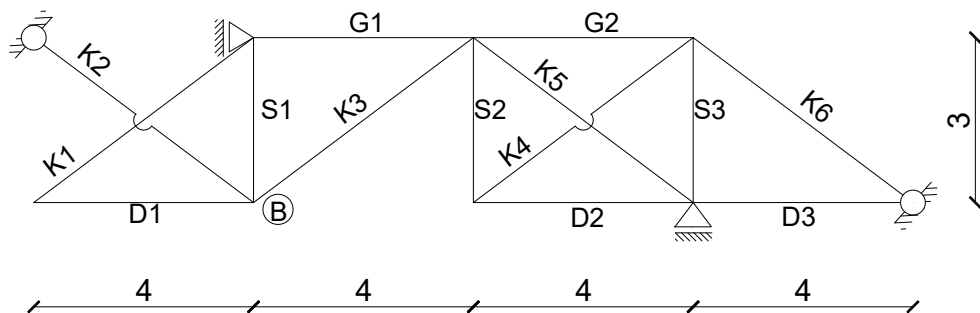
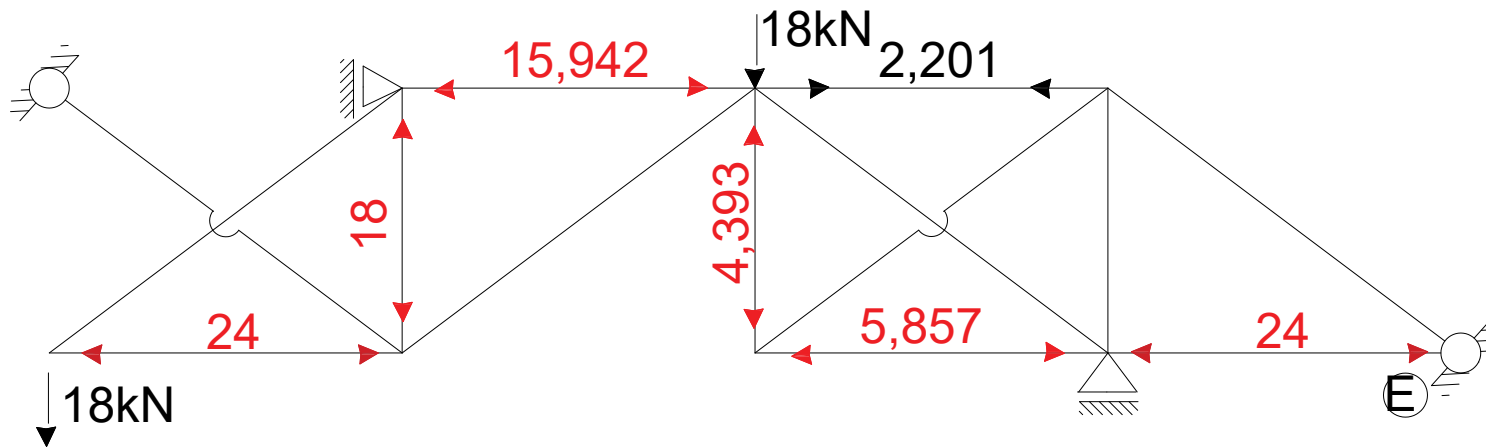
Pręt	L/EA	N
D1	4	-24,000
D2	4	-5,857
D3	4	-24,000
G1	4	-15,942
G2	4	2,201
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S2	3	-4,393
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K1	2,5	30,000
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Końcowy wykres sił normalnych – N [kN]



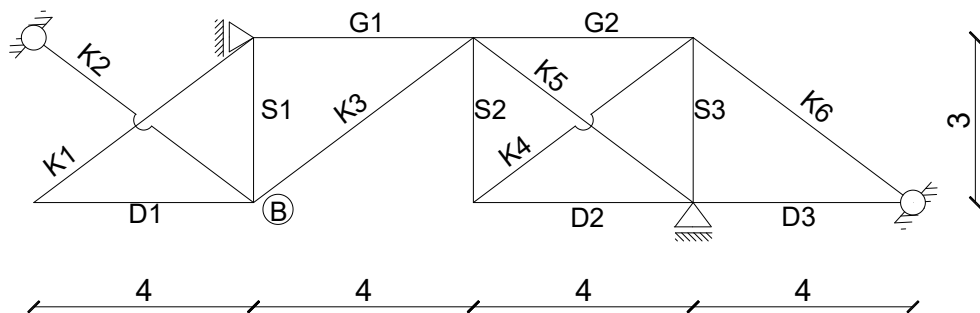
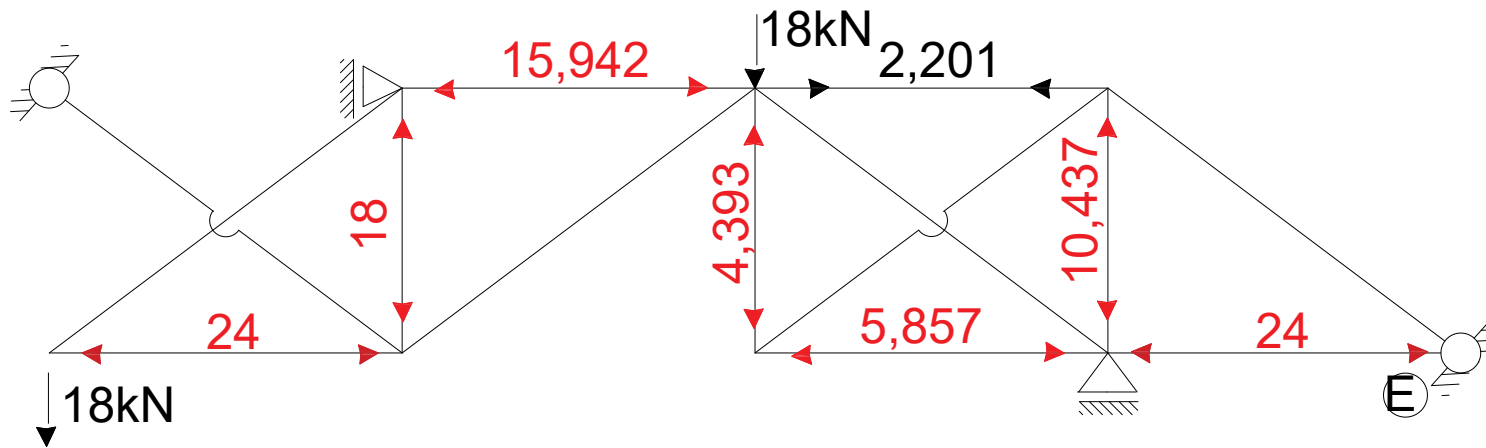
Pręt	L/EA	N
D1	4	-24,000
D2	4	-5,857
D3	4	-24,000
G1	4	-15,942
G2	4	2,201
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Końcowy wykres sił normalnych – N [kN]



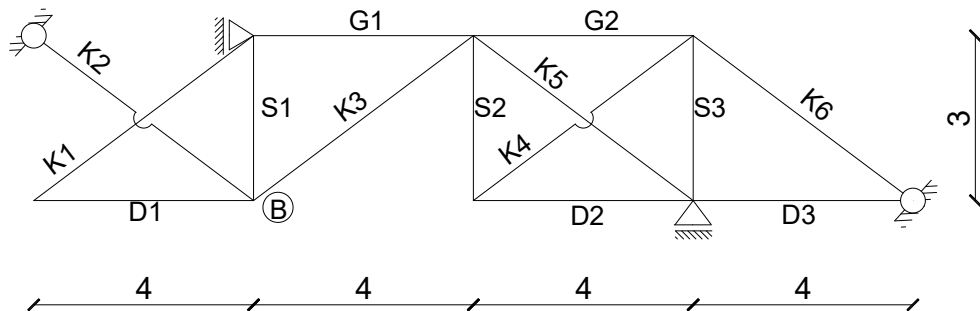
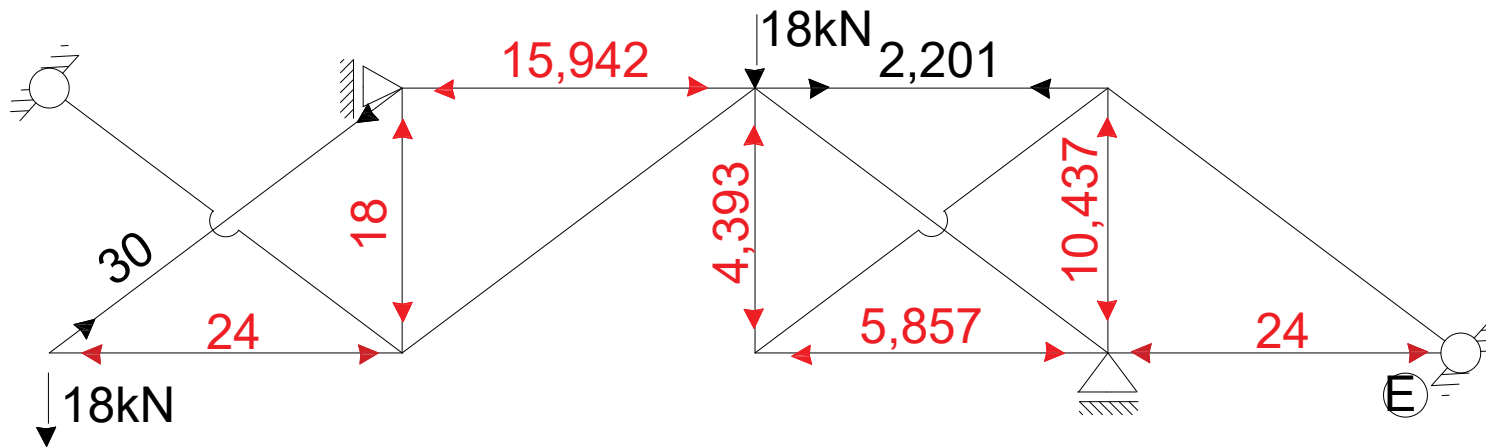
Pręt	L/EA	N
D1	4	-24,000
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D3	4	-24,000
G1	4	-15,942
G2	4	2,201
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Końcowy wykres sił normalnych – N [kN]



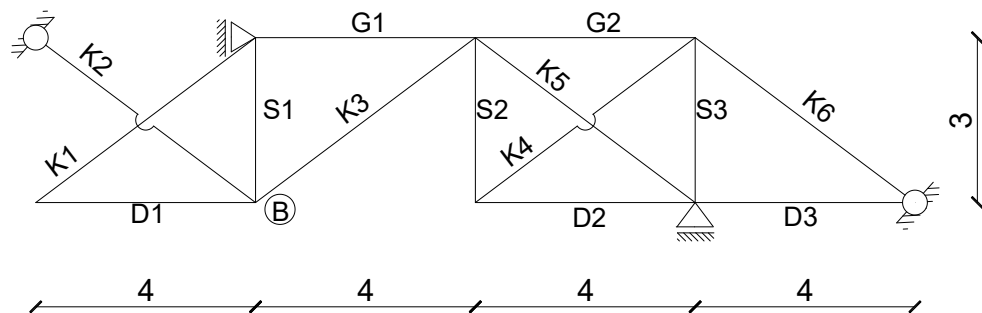
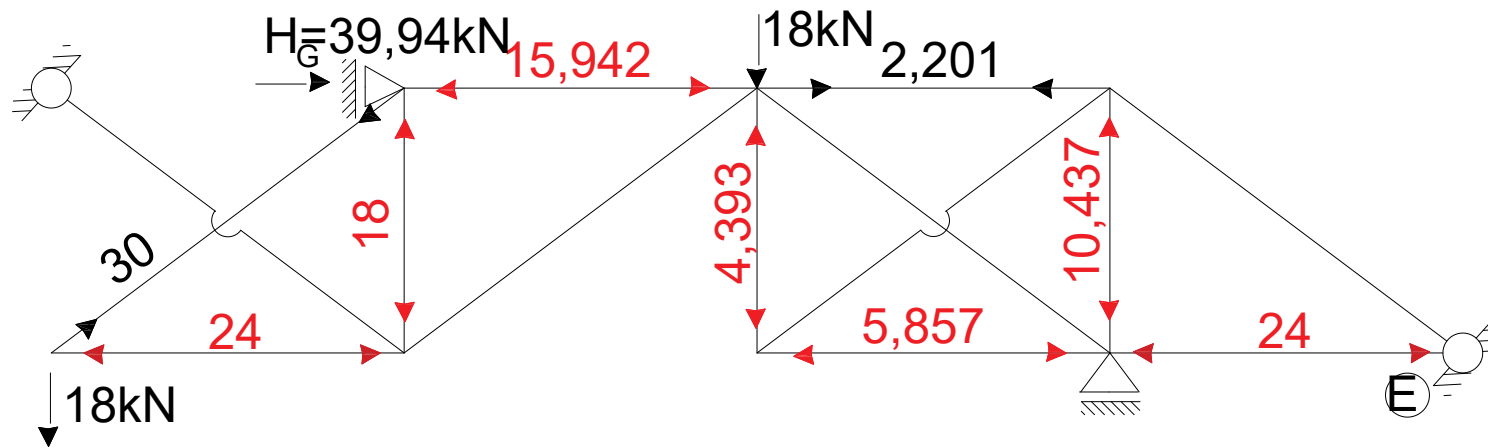
Pręt	L/EA	N
D1	4	-24,000
D2	4	-5,857
D3	4	-24,000
G1	4	-15,942
G2	4	2,201
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K3	2,5	0,000
K4	2,5	7,322
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Końcowy wykres sił normalnych – N [kN]



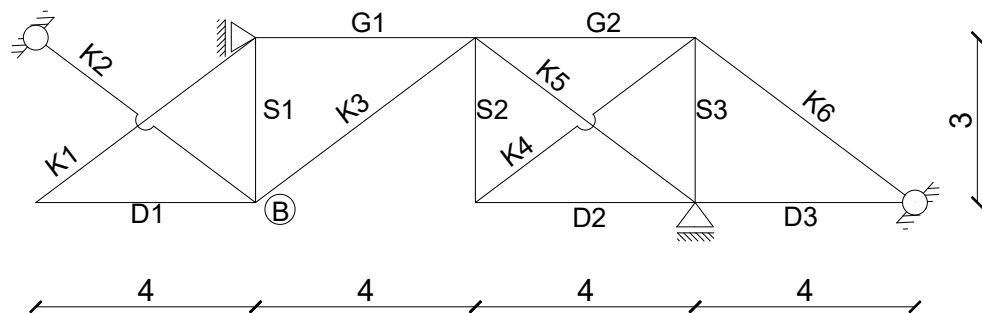
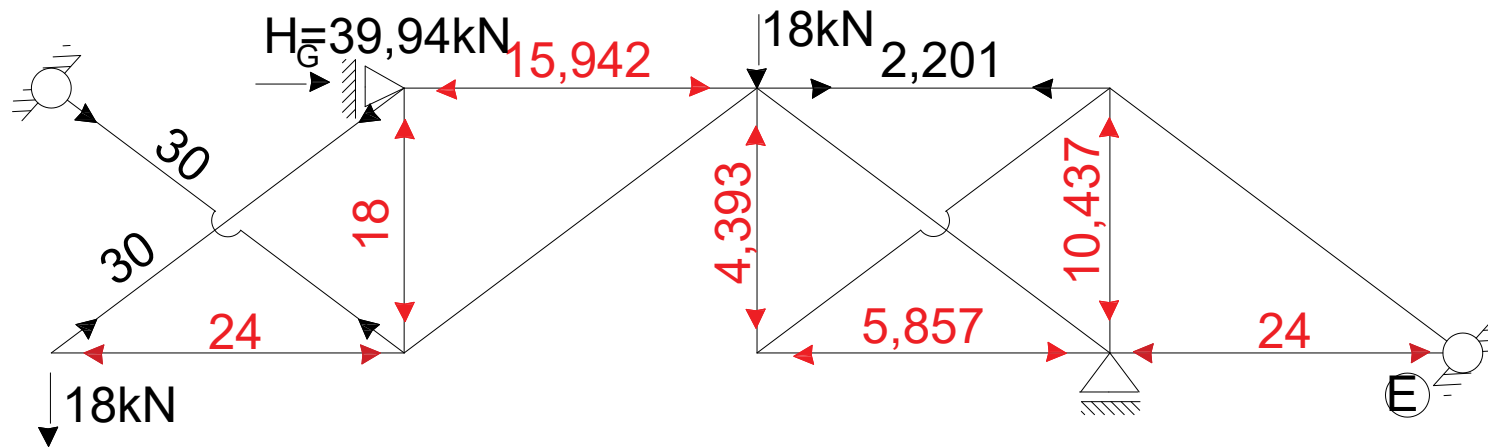
Pręt	L/EA	N
D1	4	-24,000
D2	4	-5,857
D3	4	-24,000
G1	4	-15,942
G2	4	2,201
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Końcowy wykres sił normalnych – N [kN]



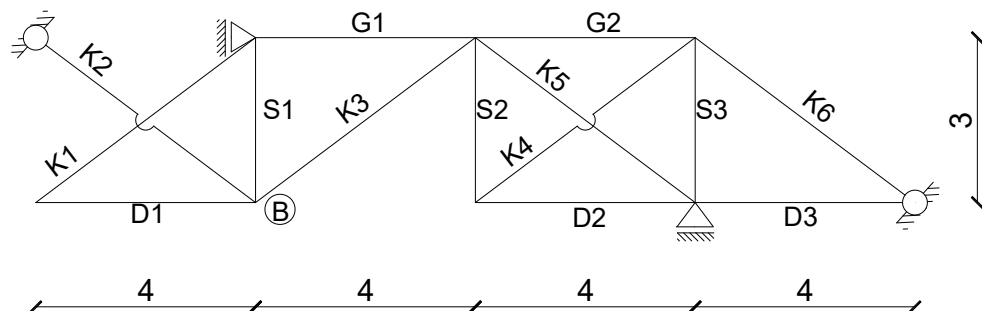
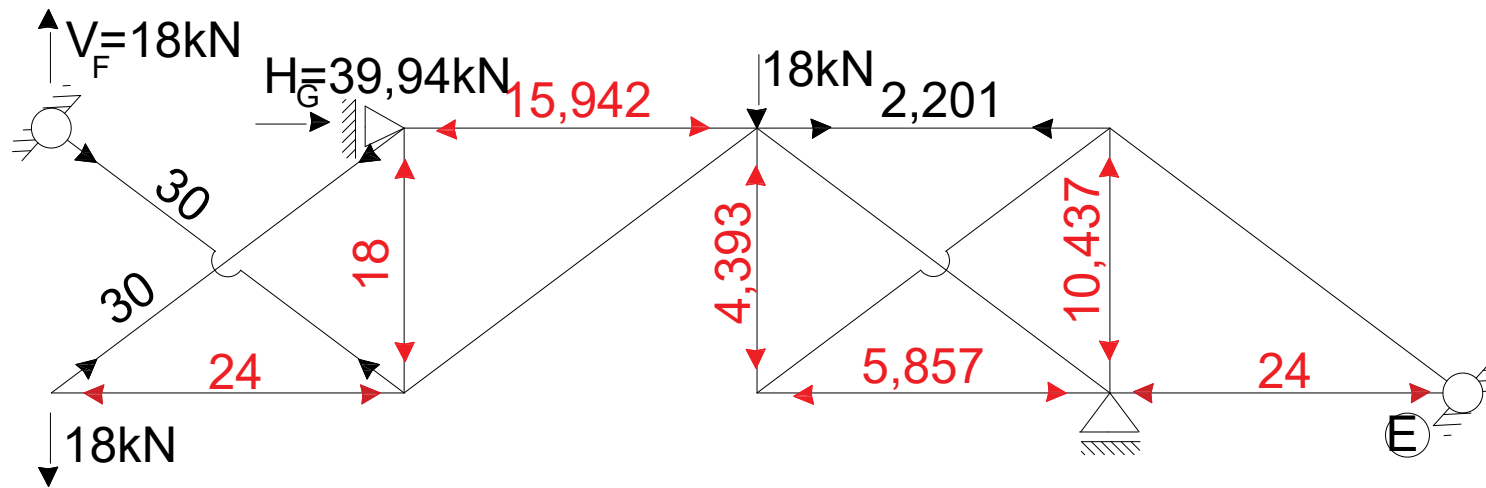
Pręt	L/EA	N
D1	4	-24,000
D2	4	-5,857
D3	4	-24,000
G1	4	-15,942
G2	4	2,201
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Końcowy wykres sił normalnych – N [kN]



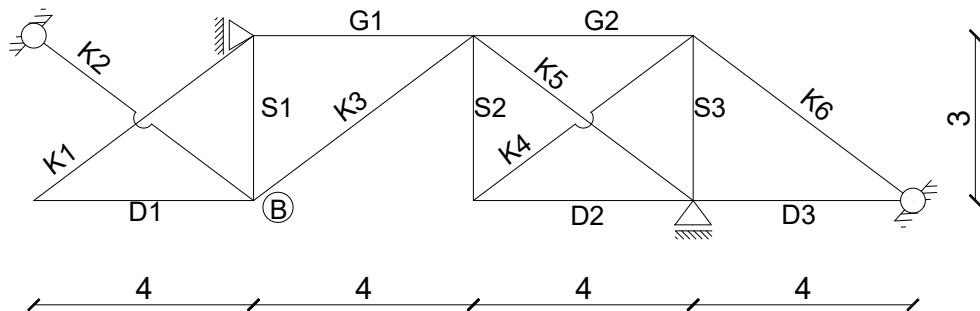
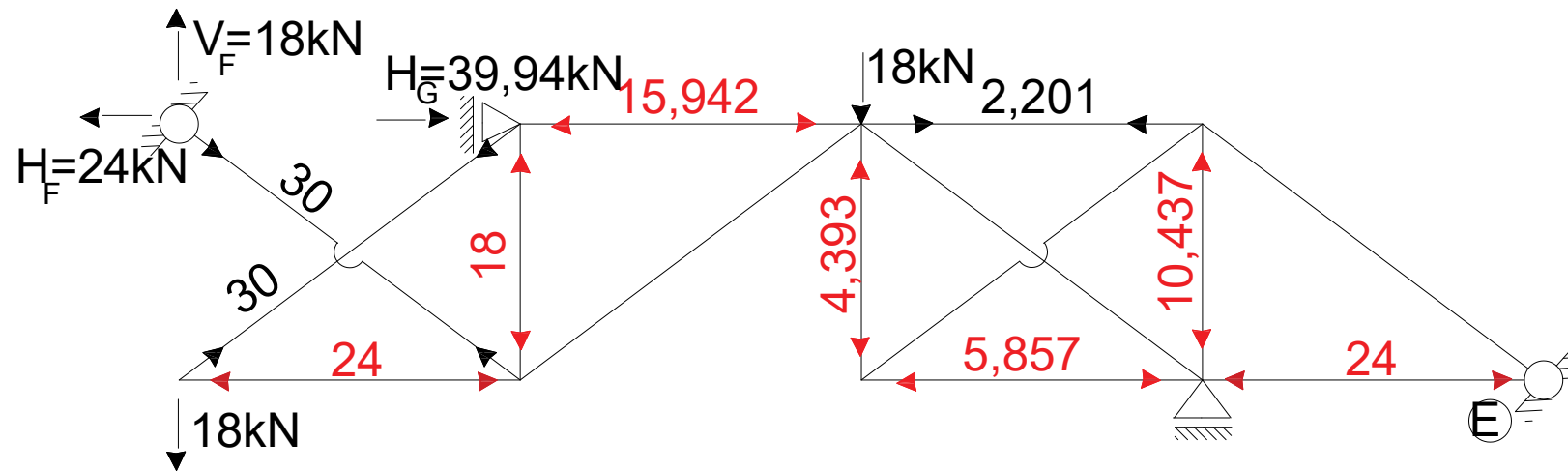
Pręt	L/EA	N
D1	4	-24,000
D2	4	-5,857
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S3	3	-10,437
K1	2,5	30,000
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K4	2,5	7,322
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K6	2,5	10,073

Końcowy wykres sił normalnych – N [kN]



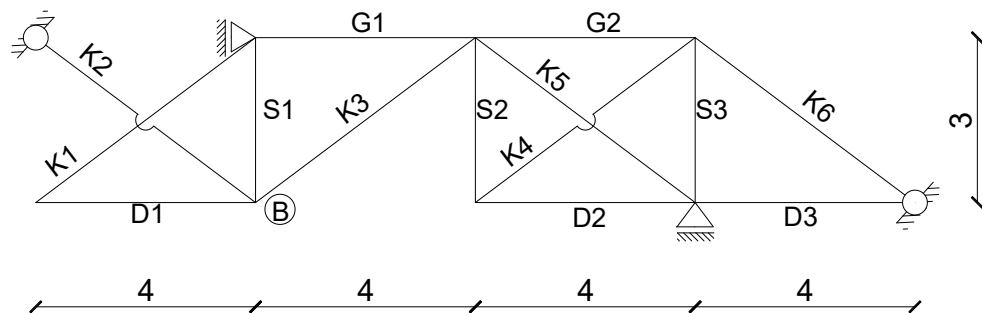
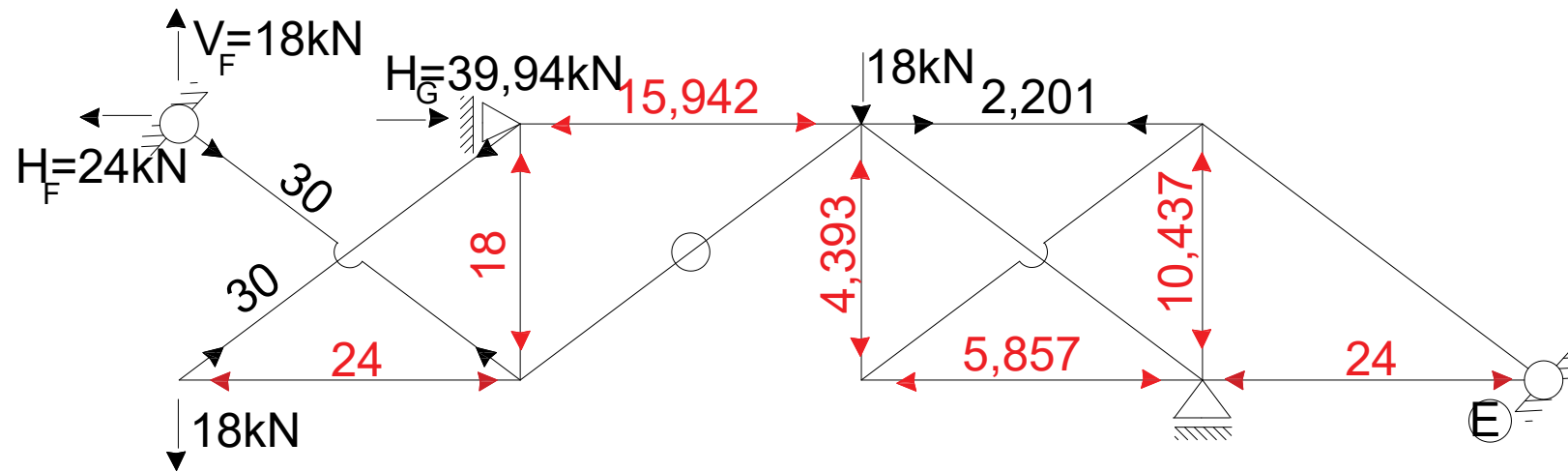
Pręt	L/EA	N
D1	4	-24,000
D2	4	-5,857
D3	4	-24,000
G1	4	-15,942
G2	4	2,201
S1	3	-18,000
S2	3	-4,393
S3	3	-10,437
K1	2,5	30,000
K2	2,5	30,000
K3	2,5	0,000
K4	2,5	7,322
K5	2,5	-22,678
K6	2,5	10,073

Końcowy wykres sił normalnych – N [kN]



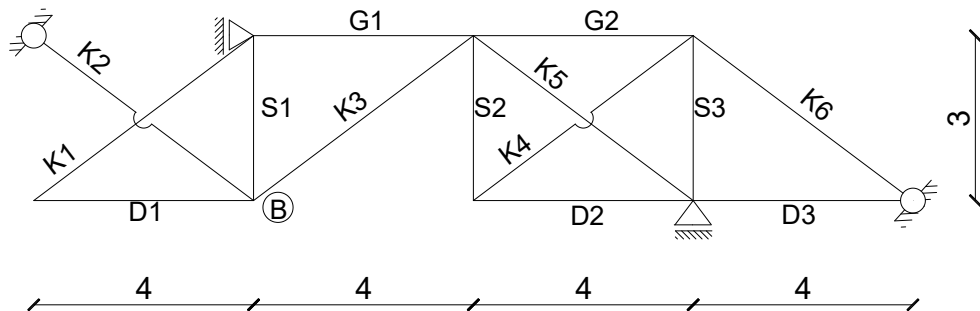
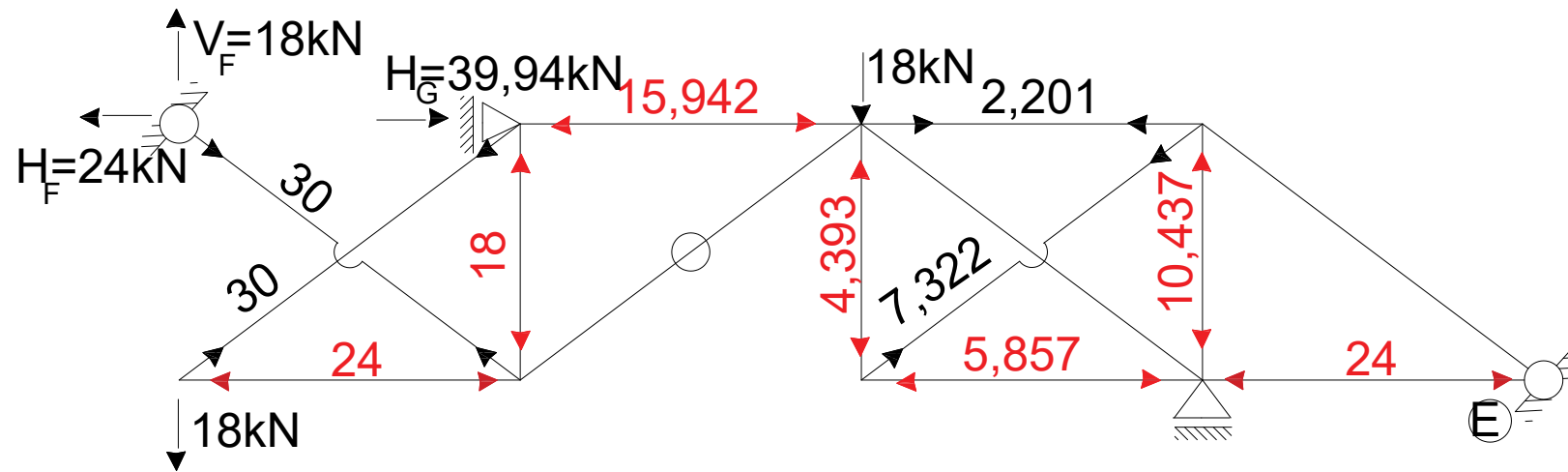
Pręt	L/EA	N
D1	4	-24,000
D2	4	-5,857
D3	4	-24,000
G1	4	-15,942
G2	4	2,201
S1	3	-18,000
S2	3	-4,393
S3	3	-10,437
K1	2,5	30,000
K2	2,5	30,000
K3	2,5	0,000
K4	2,5	7,322
K5	2,5	-22,678
K6	2,5	10,073

Końcowy wykres sił normalnych – N [kN]



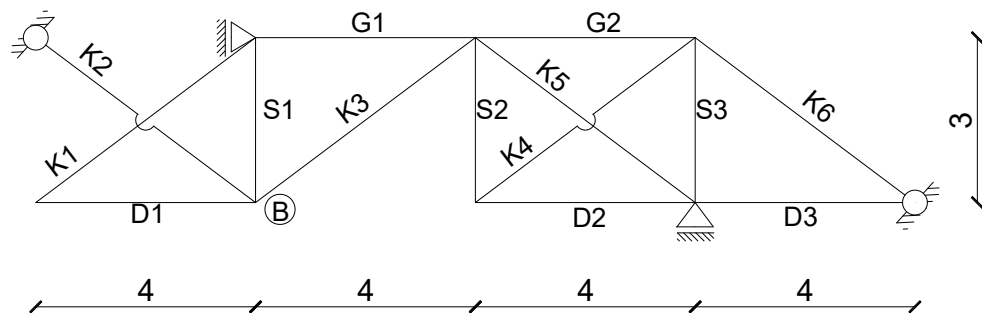
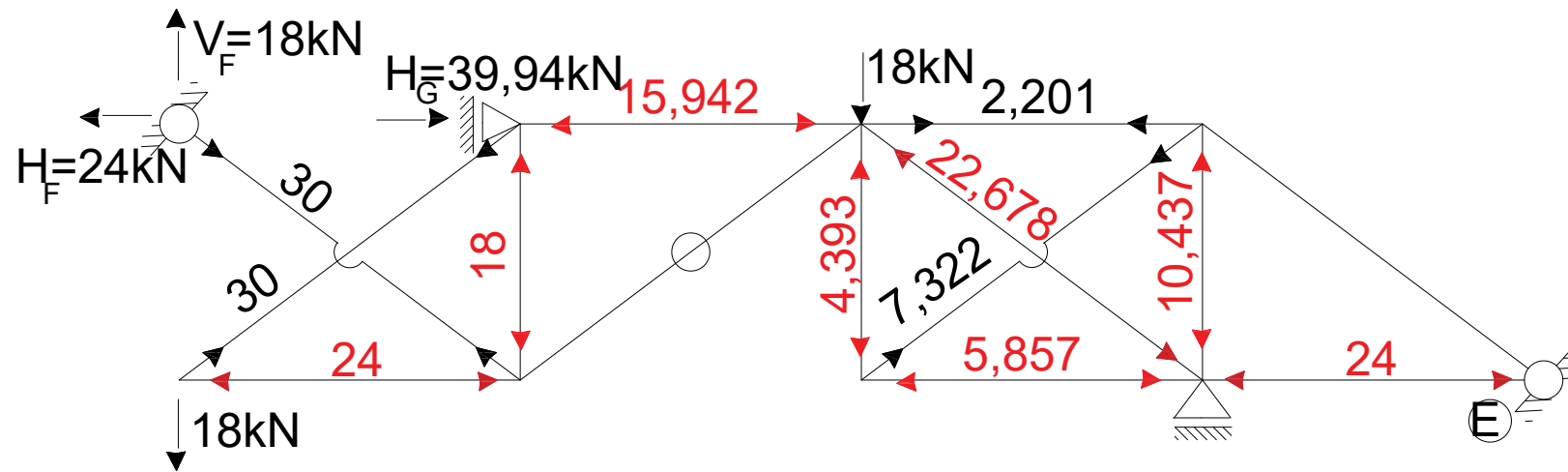
Pręt	L/EA	N
D1	4	-24,000
D2	4	-5,857
D3	4	-24,000
G1	4	-15,942
G2	4	2,201
S1	3	-18,000
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K6	2,5	10,073

Końcowy wykres sił normalnych – N [kN]



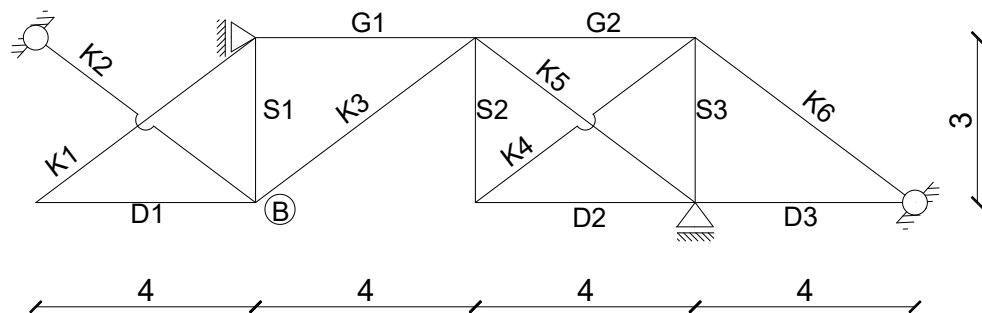
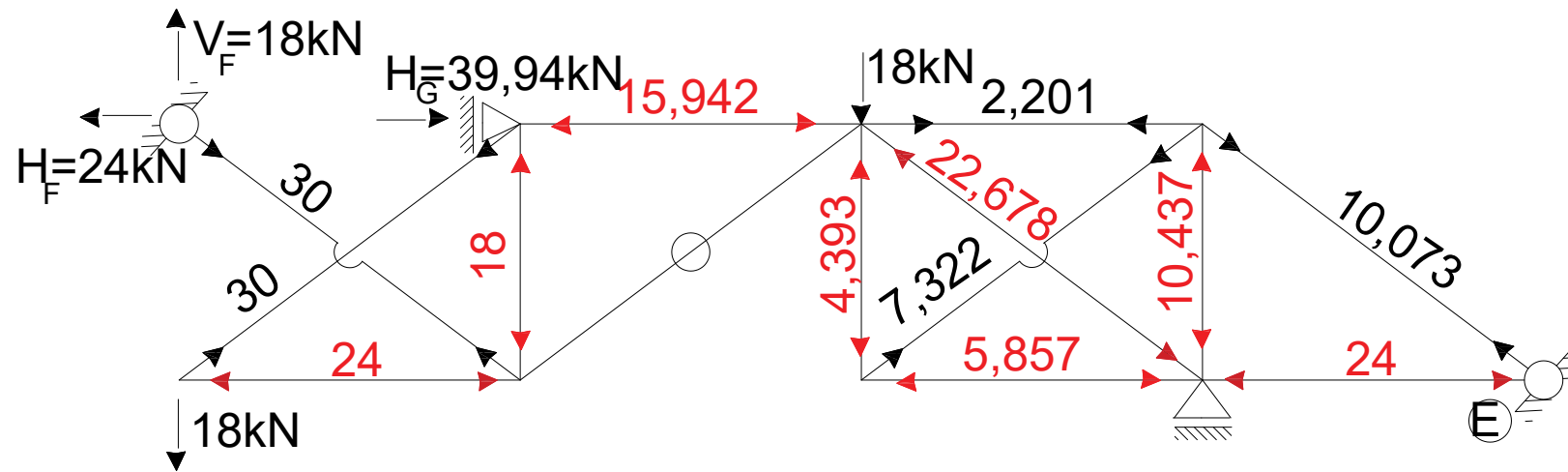
Pręt	L/EA	N
D1	4	-24,000
D2	4	-5,857
D3	4	-24,000
G1	4	-15,942
G2	4	2,201
S1	3	-18,000
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Końcowy wykres sił normalnych – N [kN]



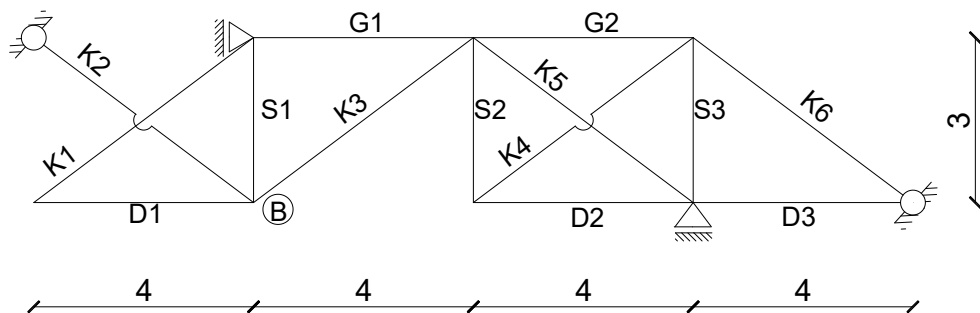
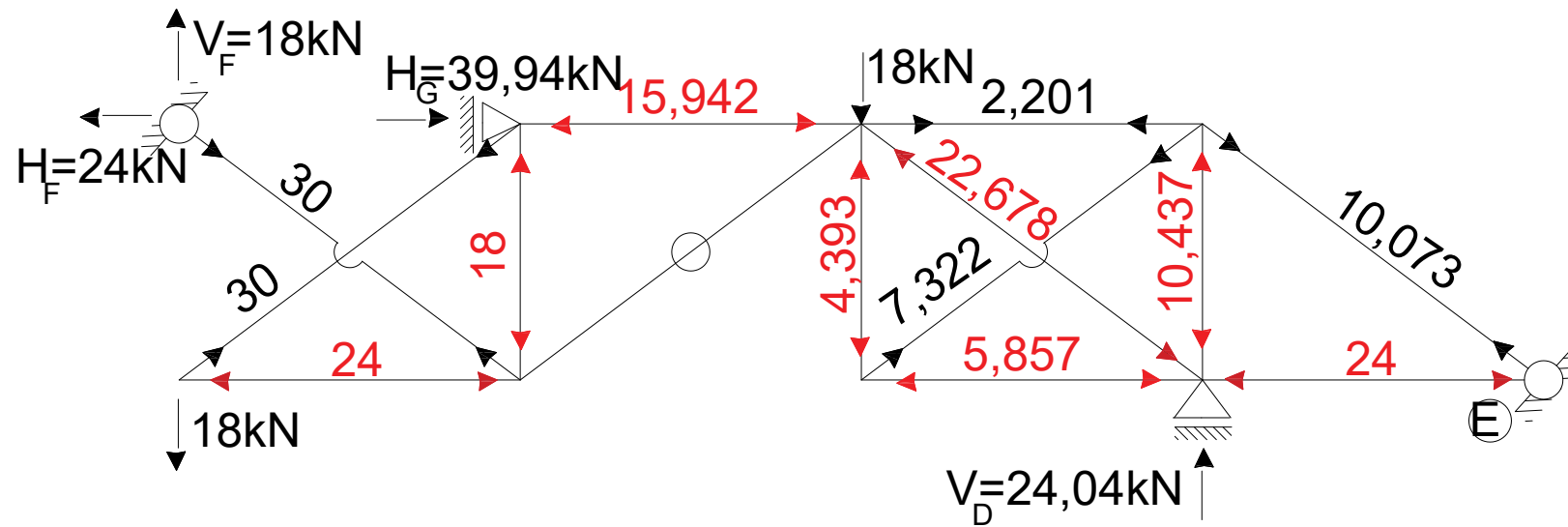
Pręt	L/EA	N
D1	4	-24,000
D2	4	-5,857
D3	4	-24,000
G1	4	-15,942
G2	4	2,201
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Końcowy wykres sił normalnych – N [kN]



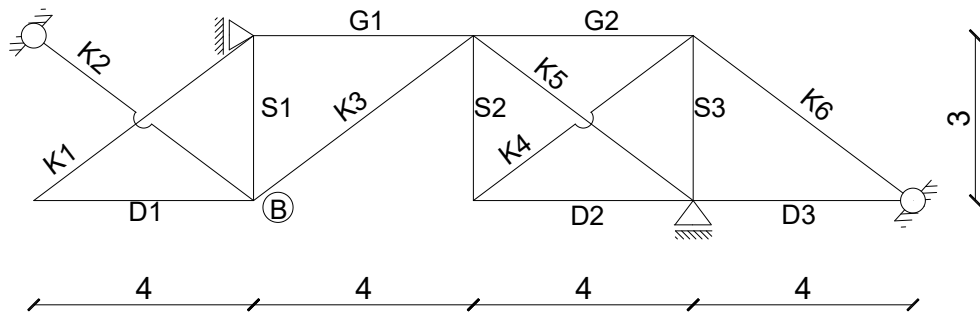
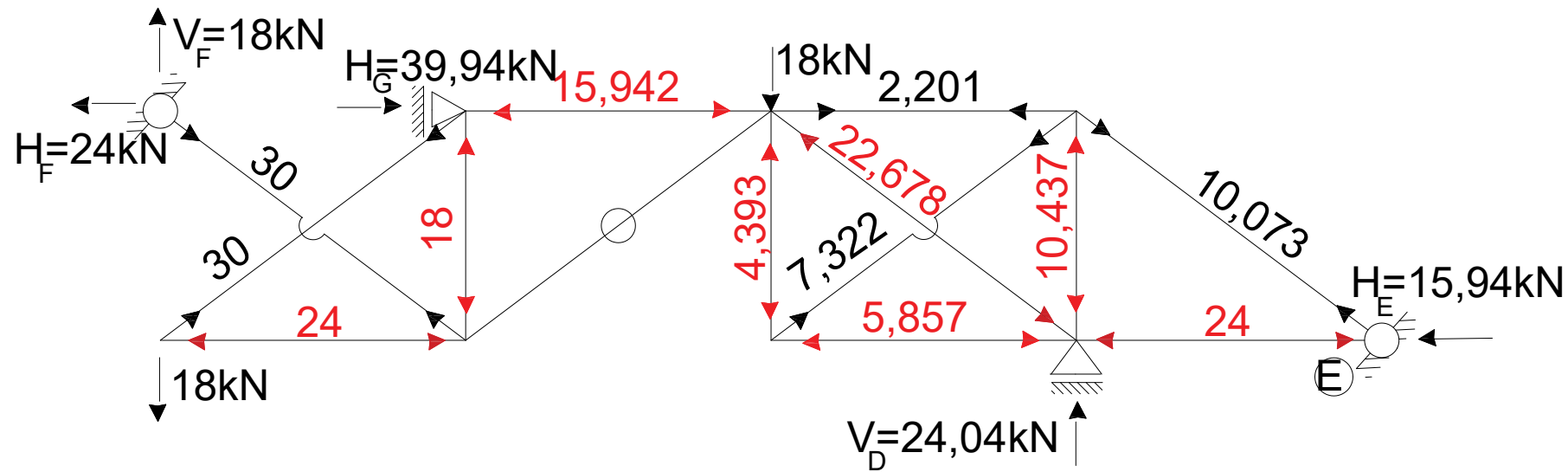
Pręt	L/EA	N
D1	4	-24,000
D2	4	-5,857
D3	4	-24,000
G1	4	-15,942
G2	4	2,201
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Końcowy wykres sił normalnych – N [kN]



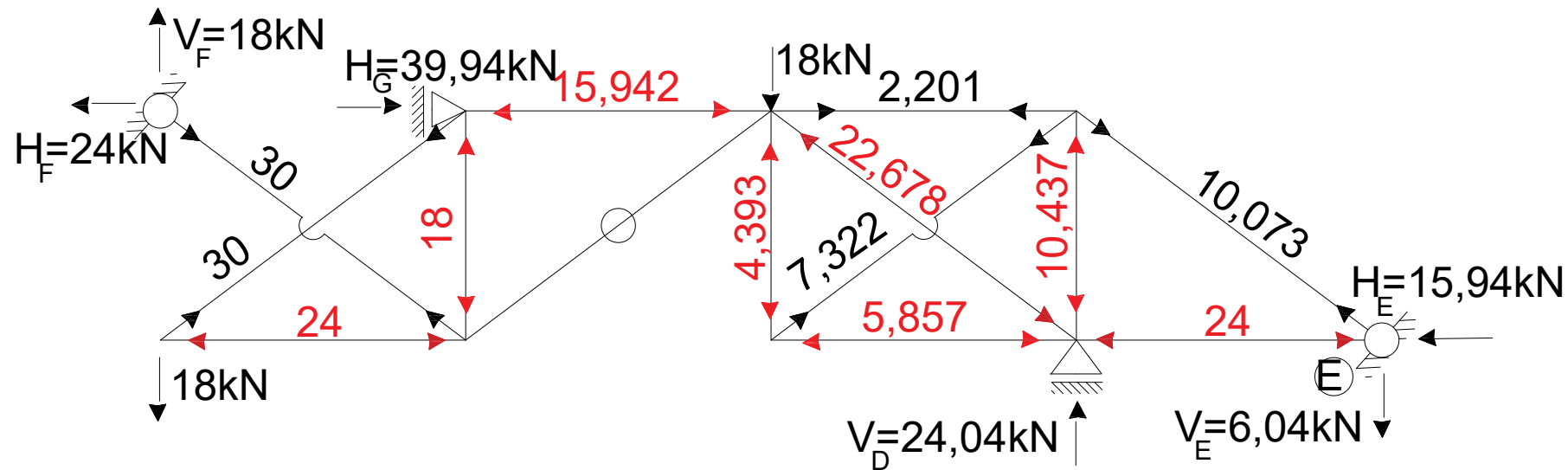
Pręt	L/EA	N
D1	4	-24,000
D2	4	-5,857
D3	4	-24,000
G1	4	-15,942
G2	4	2,201
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Końcowy wykres sił normalnych – N [kN]

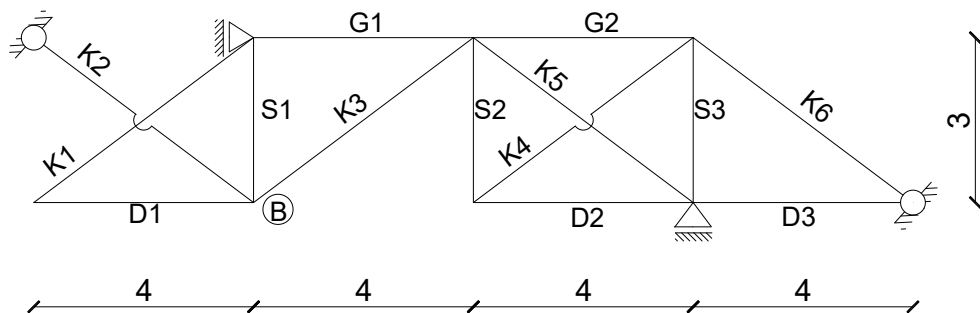


Pręt	L/EA	N
D1	4	-24,000
D2	4	-5,857
D3	4	-24,000
G1	4	-15,942
G2	4	2,201
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Końcowy wykres sił normalnych – N [kN]

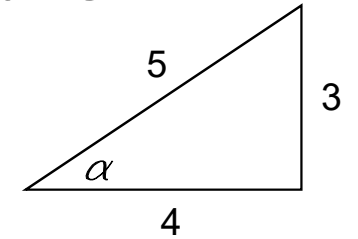
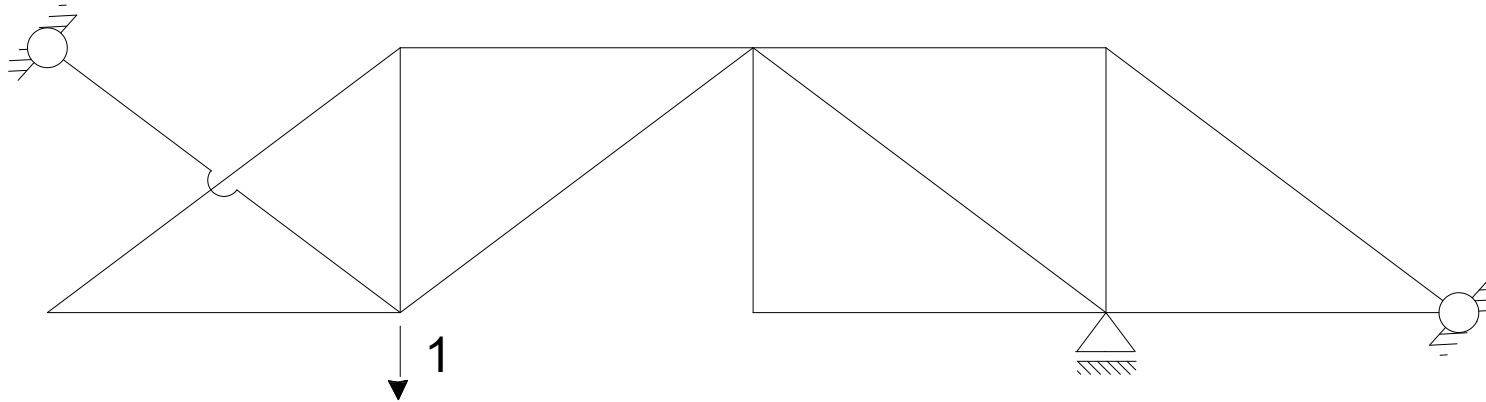


Pręt	L/EA	N
D1	4	-24,000
D2	4	-5,857
D3	4	-24,000
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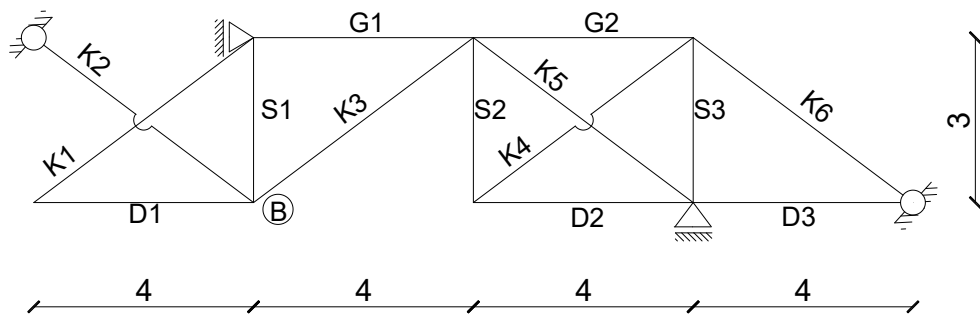
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Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:

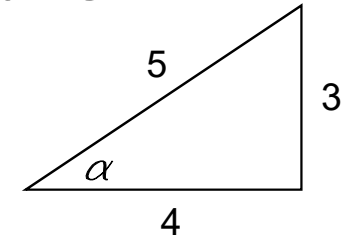
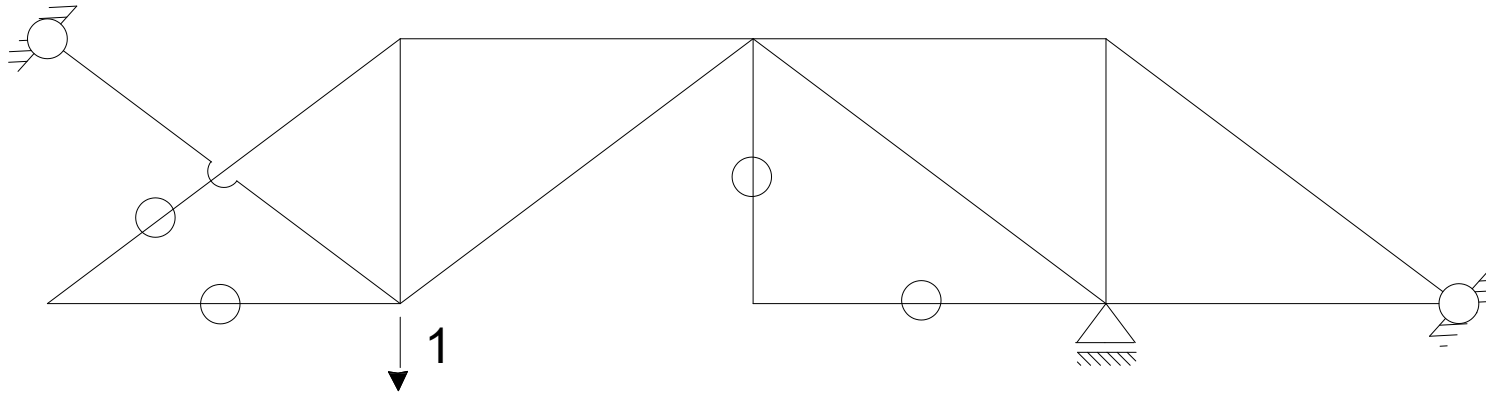


$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$

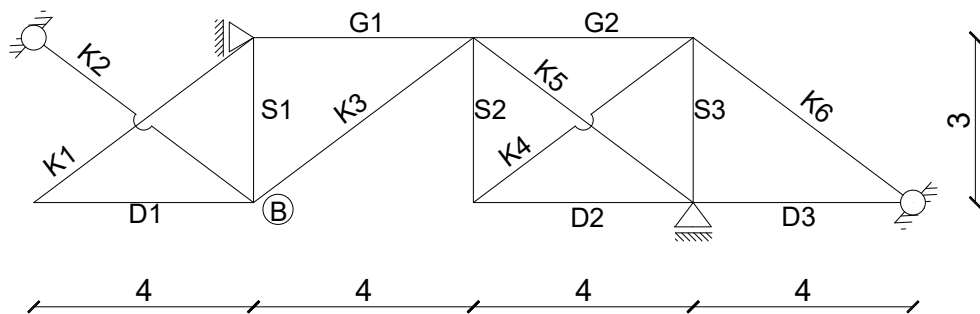


Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:

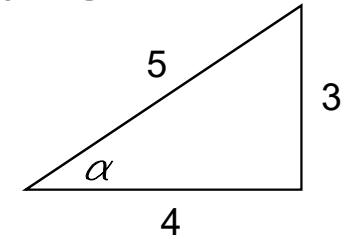
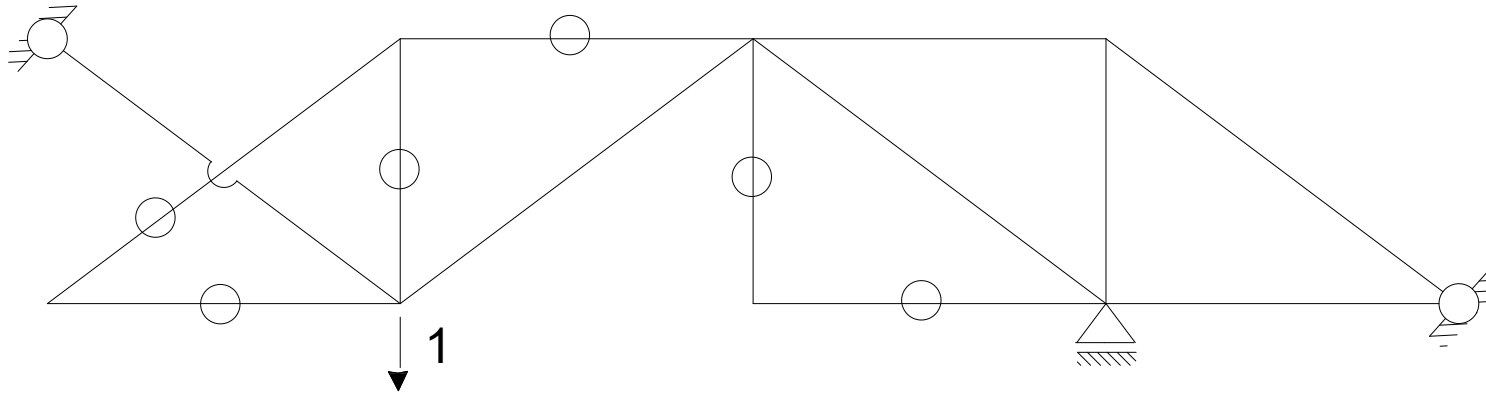


$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$

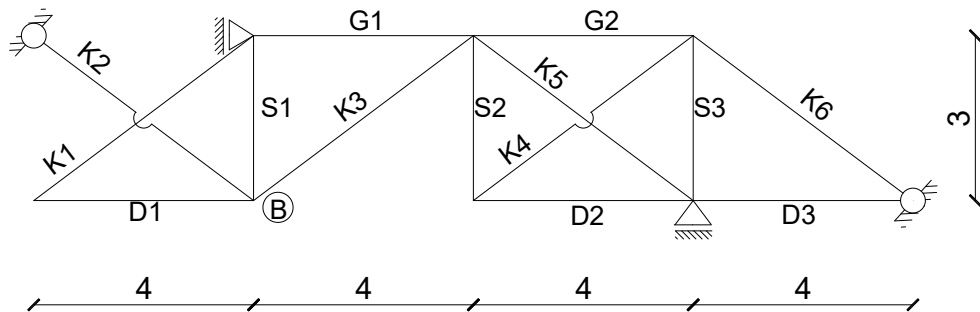


Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:

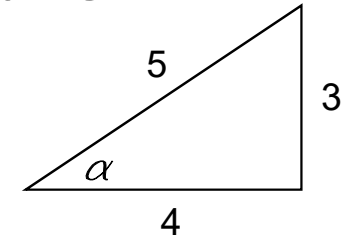
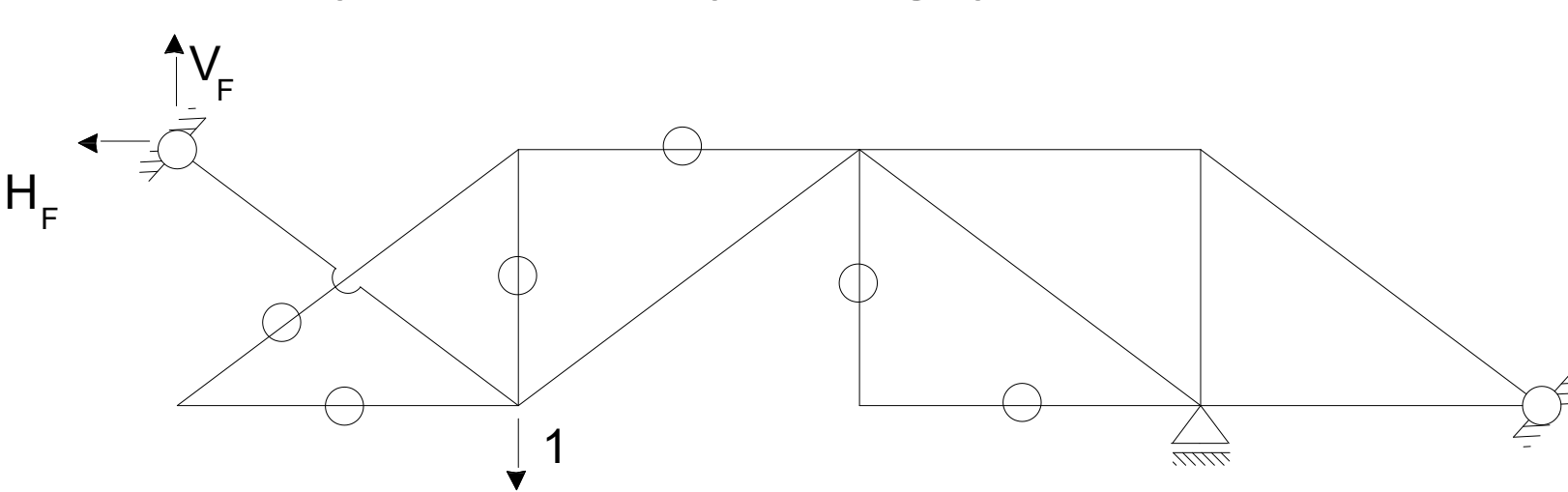


$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$

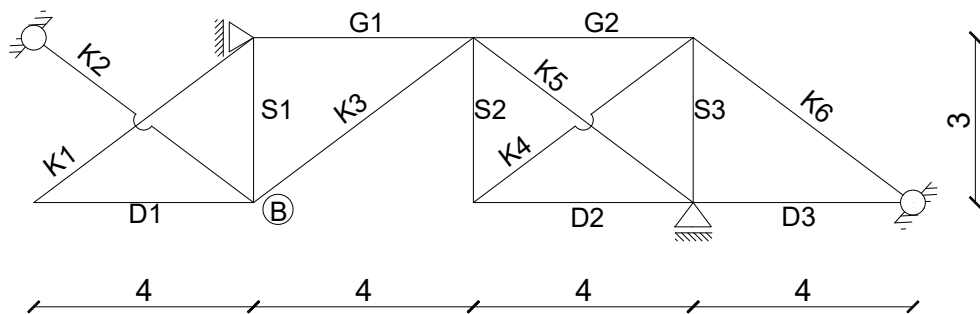


Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:

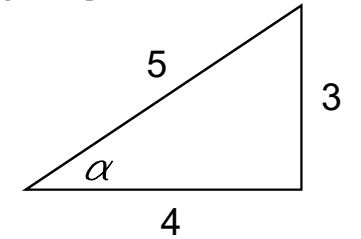
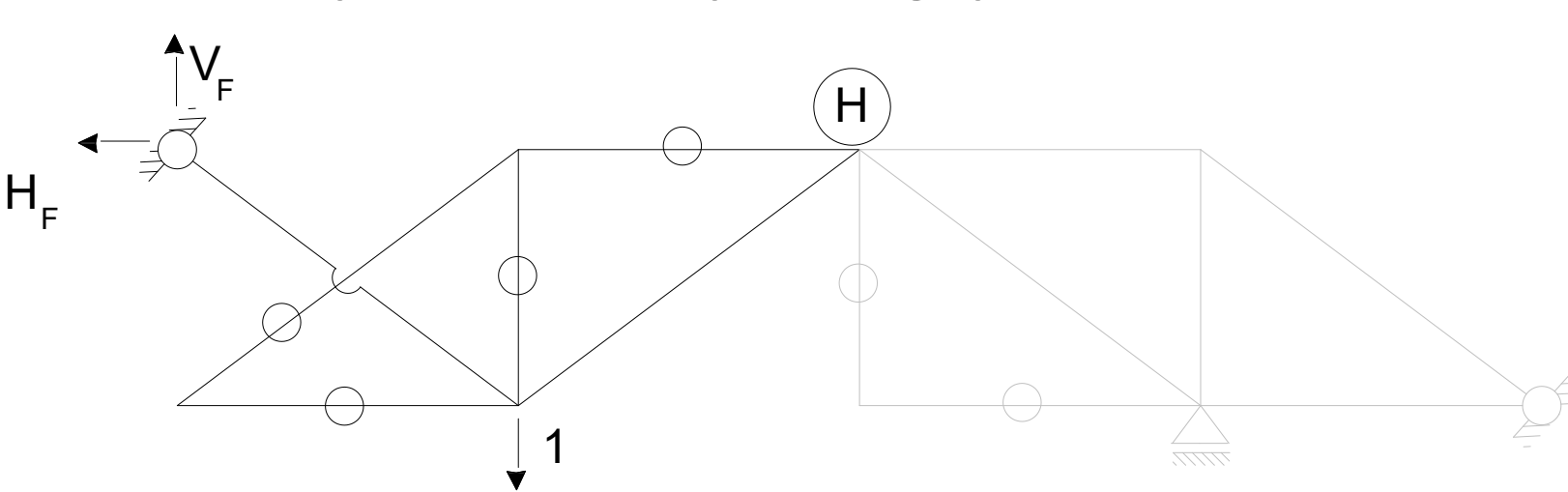


$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$

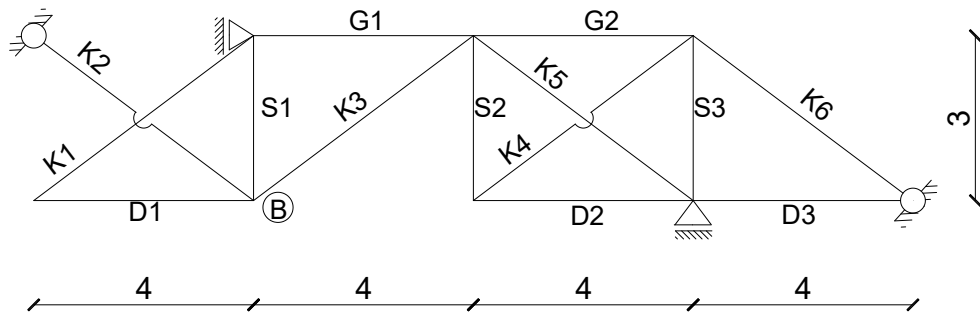


Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:



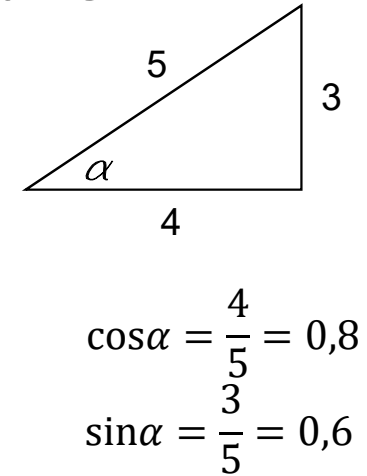
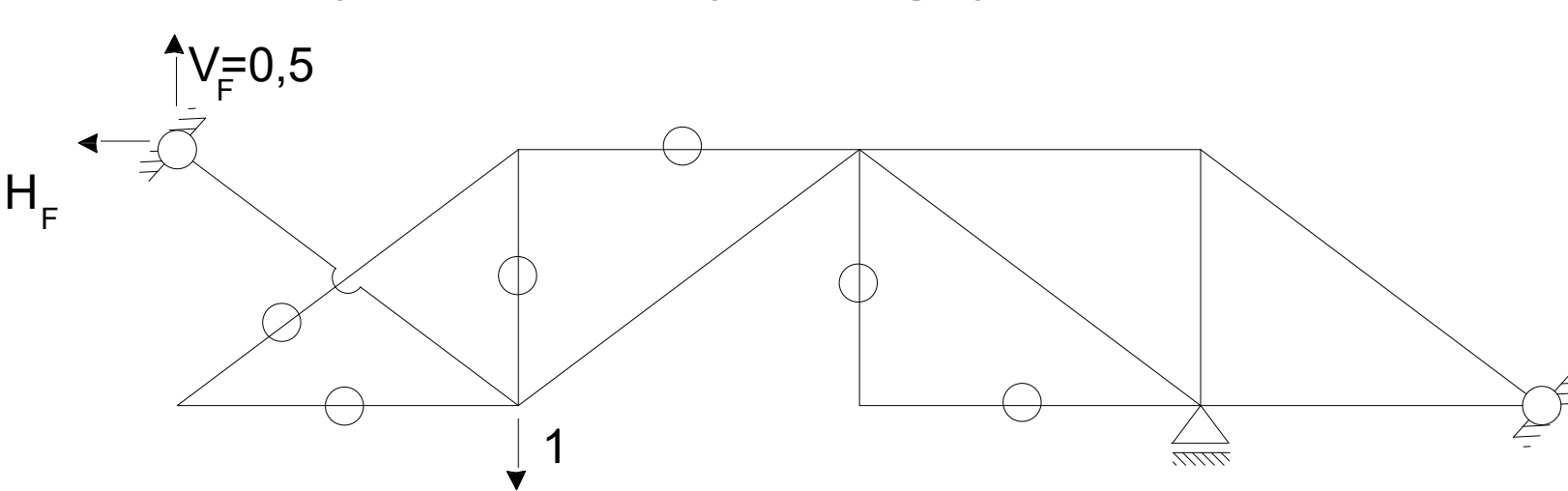
$$\cos \alpha = \frac{4}{5} = 0,8$$

$$\sin \alpha = \frac{3}{5} = 0,6$$

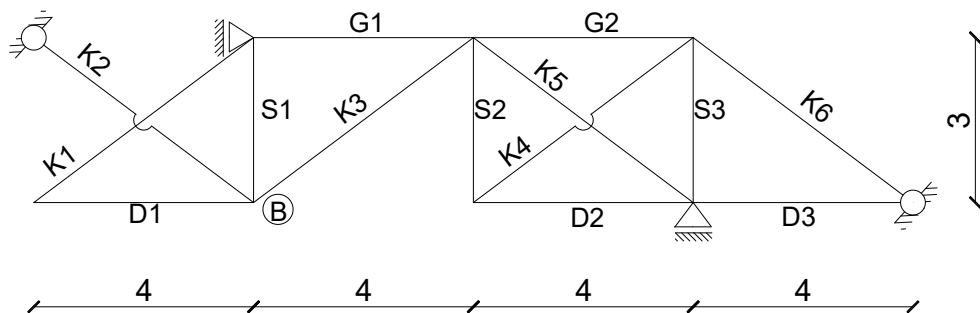


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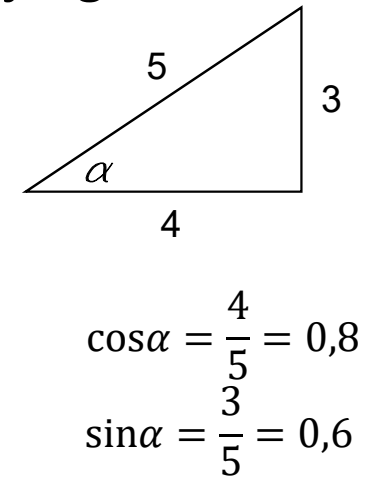
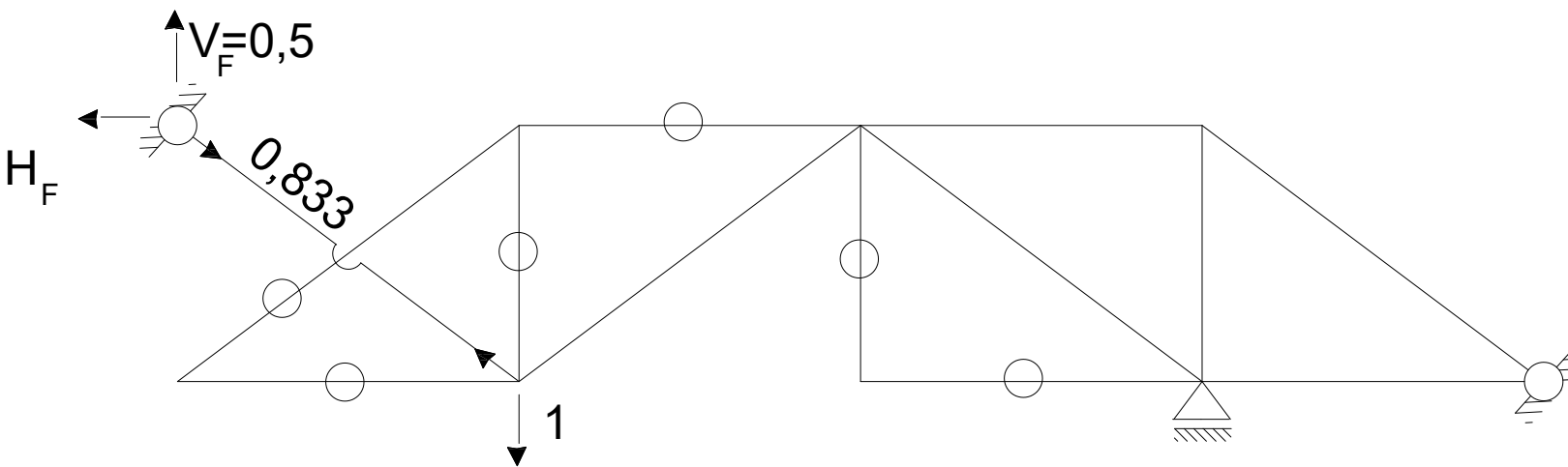
Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:



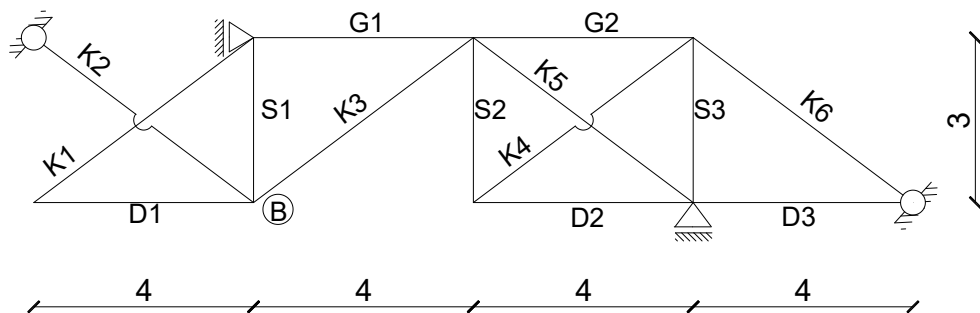
$$\sum M_H^L = -1 \cdot 4 - V_F \cdot 8 = 0 \rightarrow V_F = 0,5$$



Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:

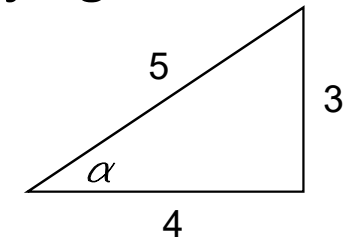
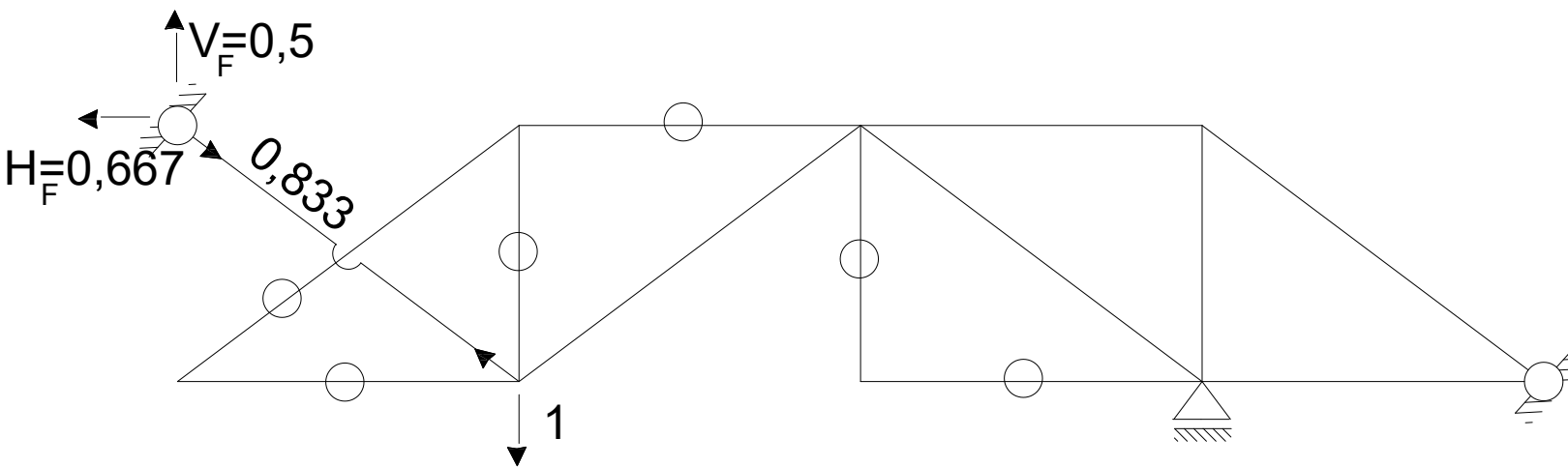


$$\sum M_H^L = -1 \cdot 4 - V_F \cdot 8 = 0 \rightarrow V_F = 0,5$$



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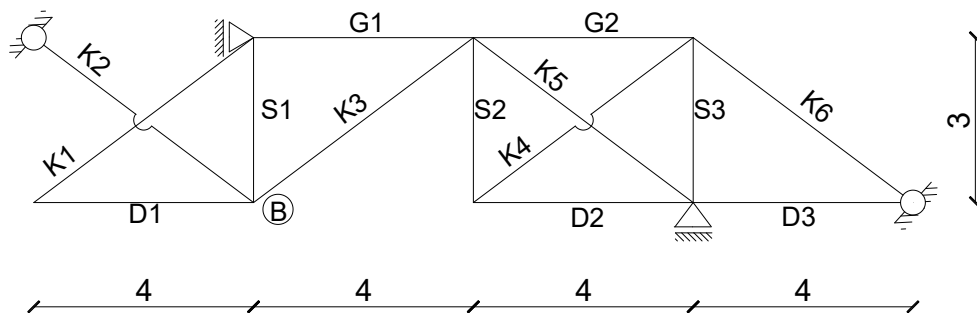
Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:



$$\cos \alpha = \frac{4}{5} = 0,8$$

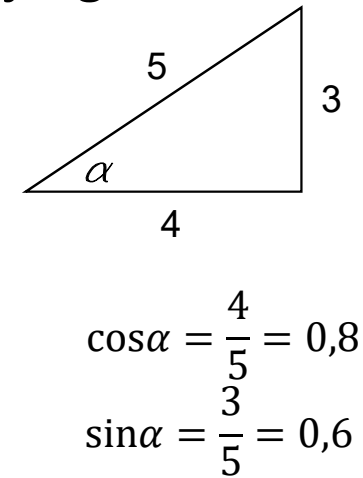
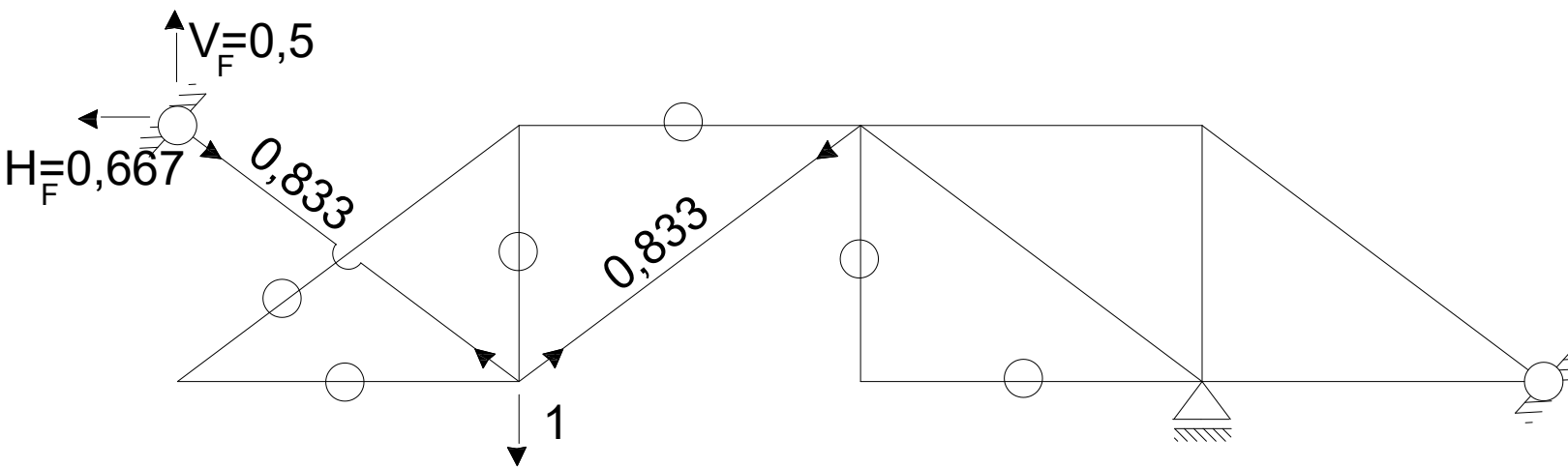
$$\sin \alpha = \frac{3}{5} = 0,6$$

$$\sum M_H^L = -1 \cdot 4 - V_F \cdot 8 = 0 \rightarrow V_F = 0,5$$

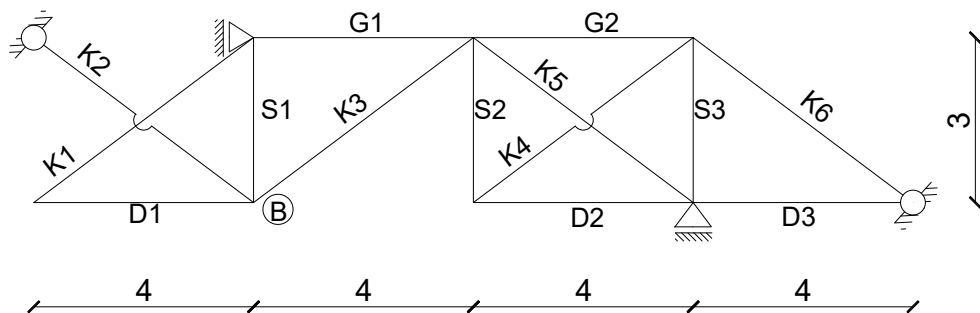


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Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:

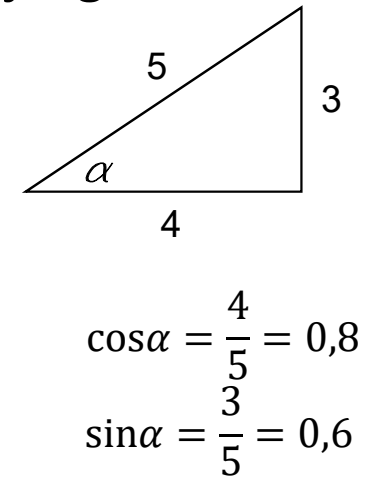
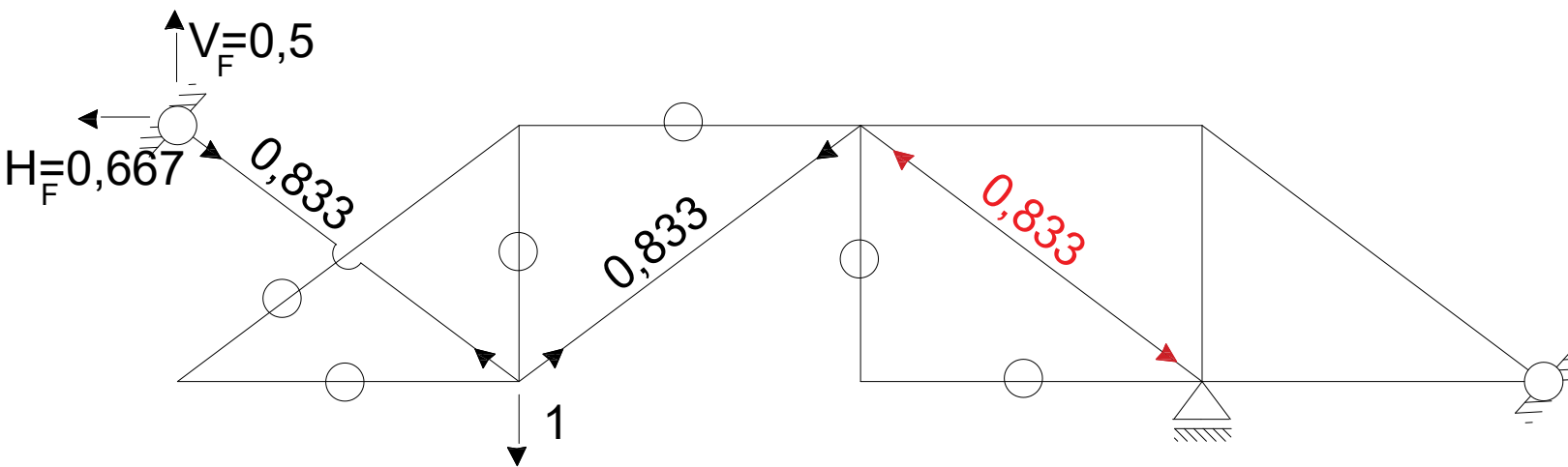


$$\sum M_H^L = -1 \cdot 4 - V_F \cdot 8 = 0 \rightarrow V_F = 0,5$$

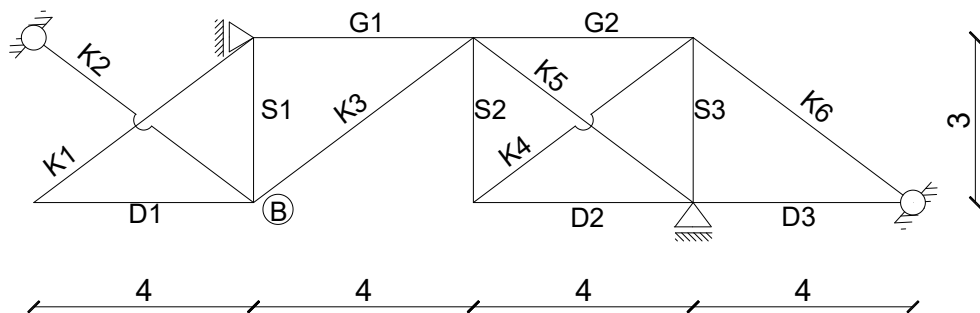


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Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:

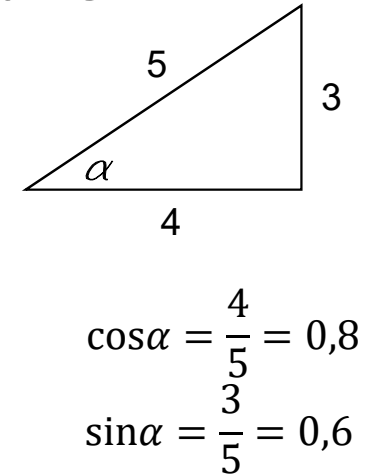
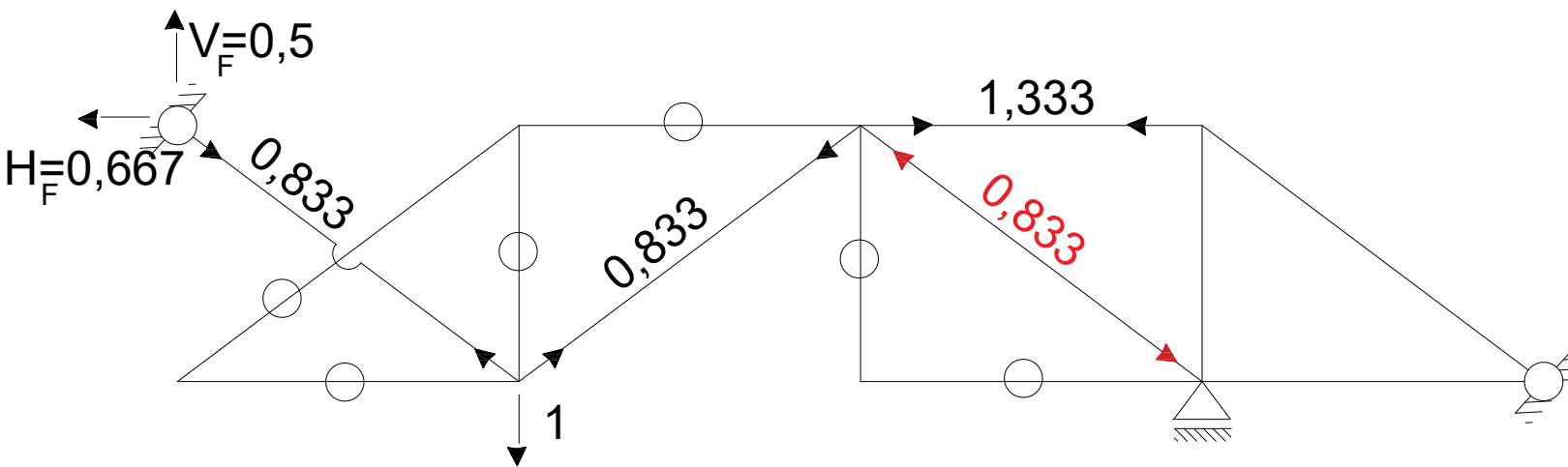


$$\sum M_H^L = -1 \cdot 4 - V_F \cdot 8 = 0 \rightarrow V_F = 0,5$$

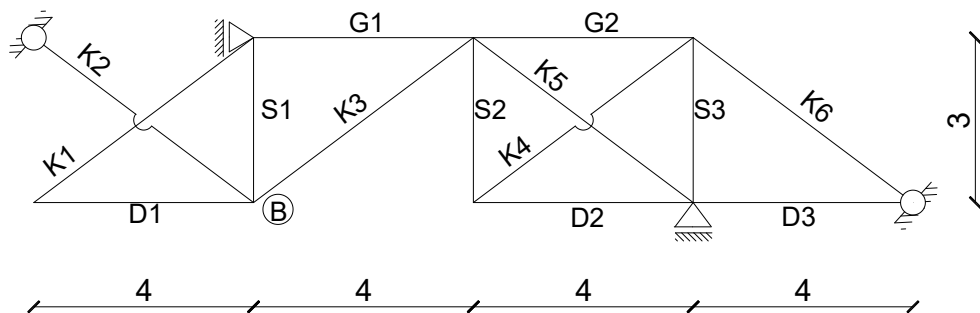


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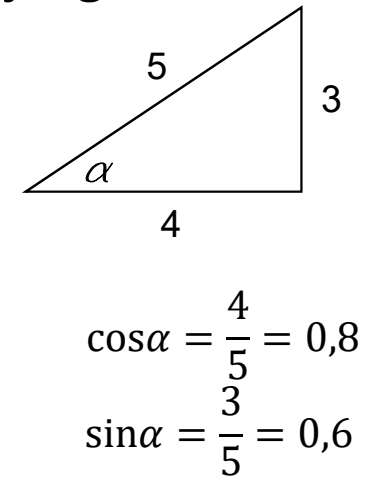
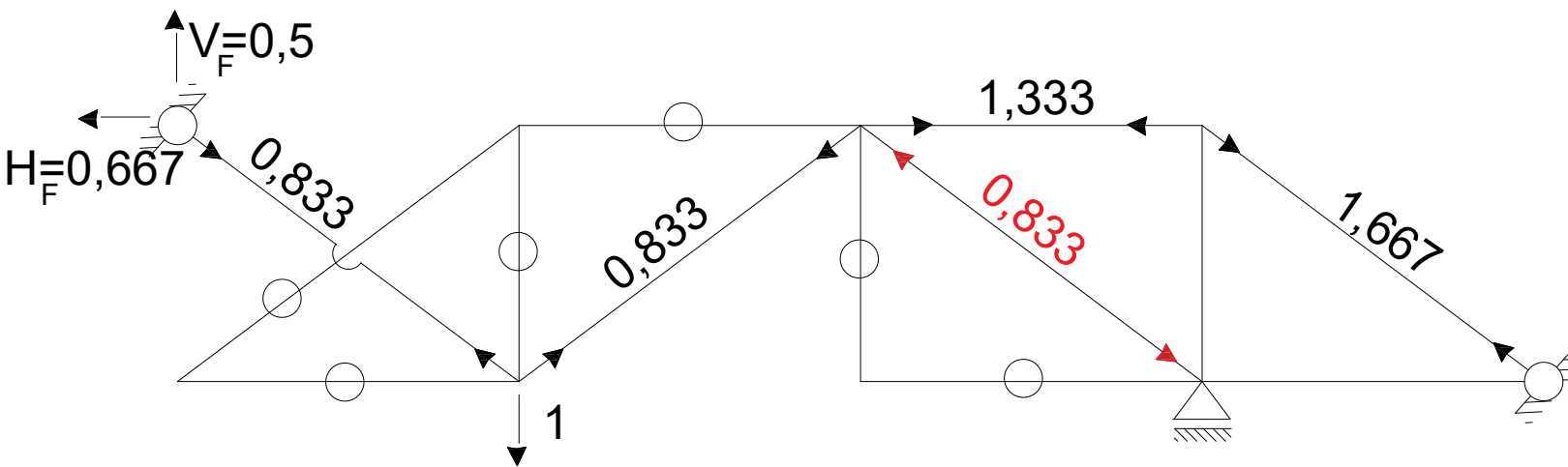
Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:



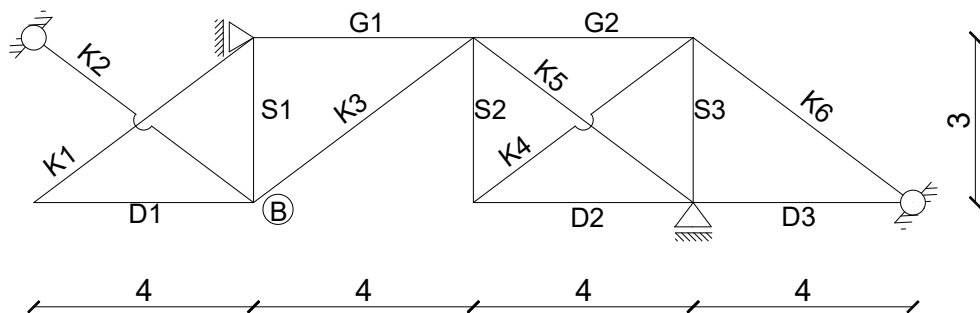
$$\sum M_H^L = -1 \cdot 4 - V_F \cdot 8 = 0 \rightarrow V_F = 0,5$$



Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:

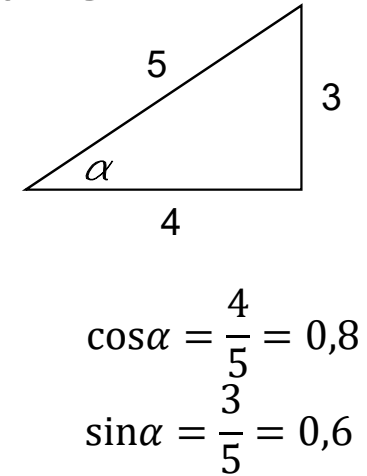
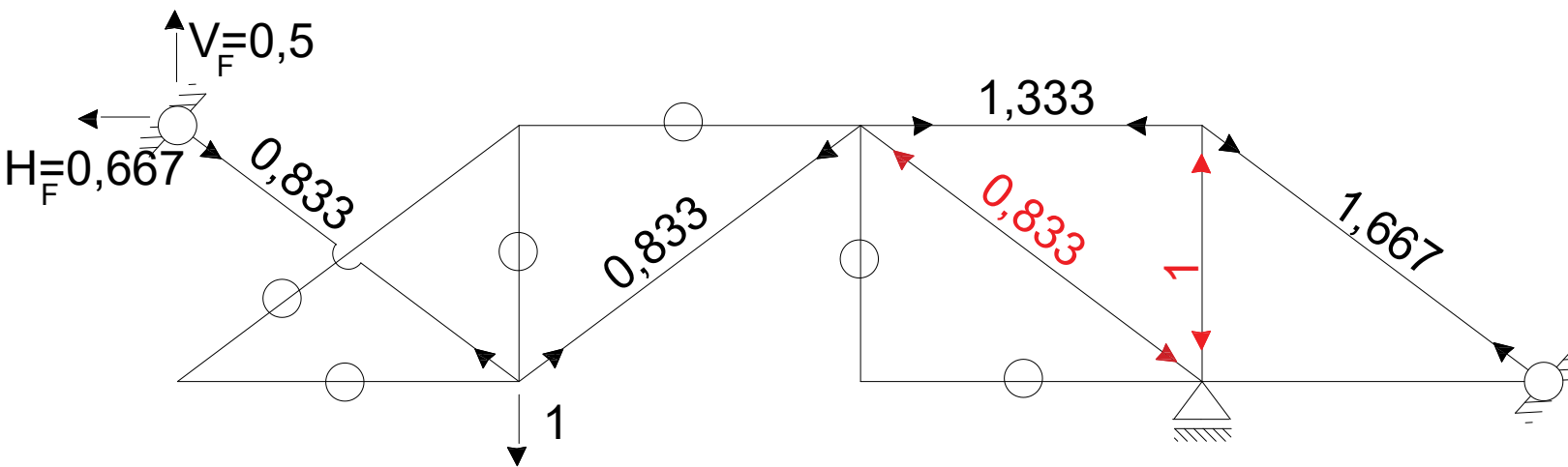


$$\sum M_H^L = -1 \cdot 4 - V_F \cdot 8 = 0 \rightarrow V_F = 0,5$$

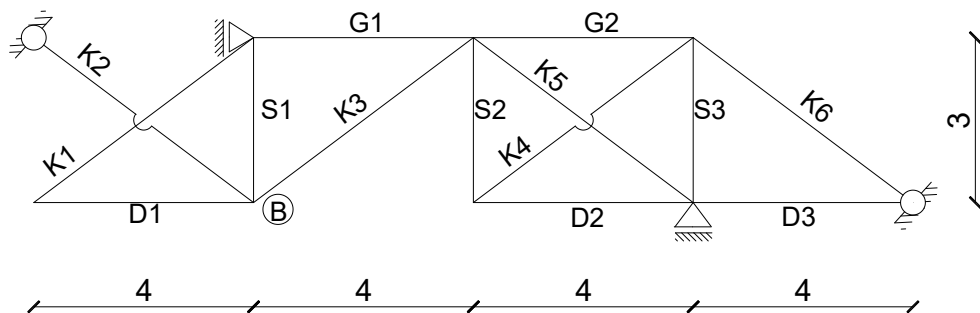


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Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:

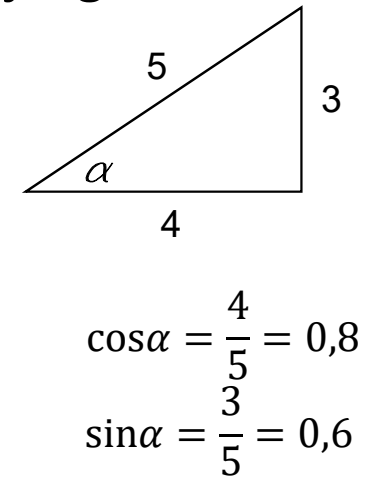
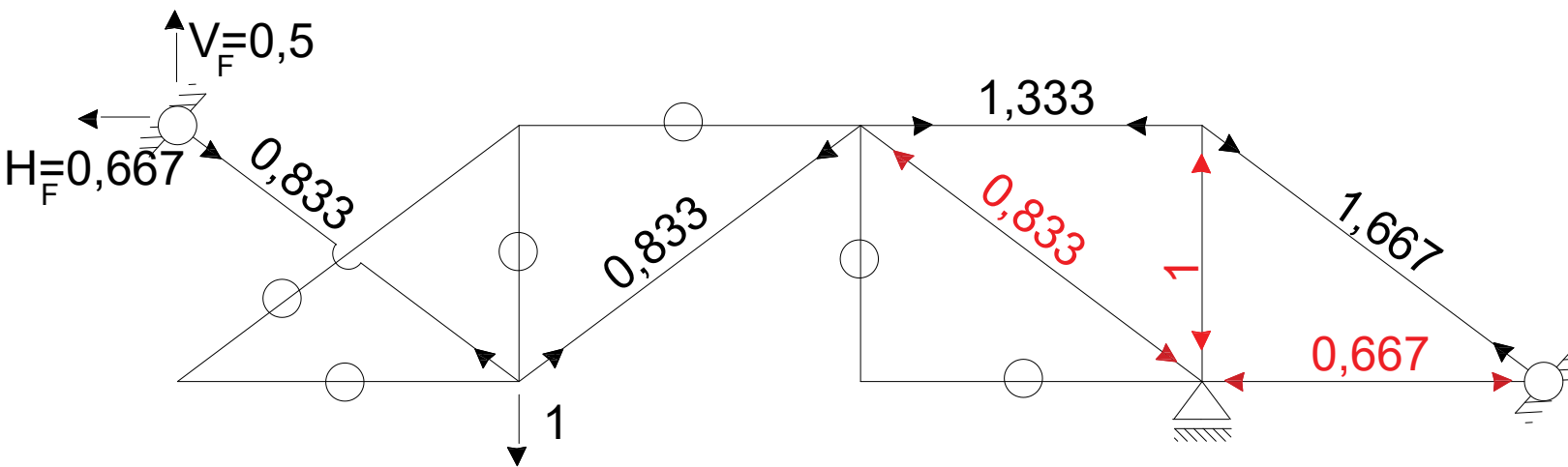


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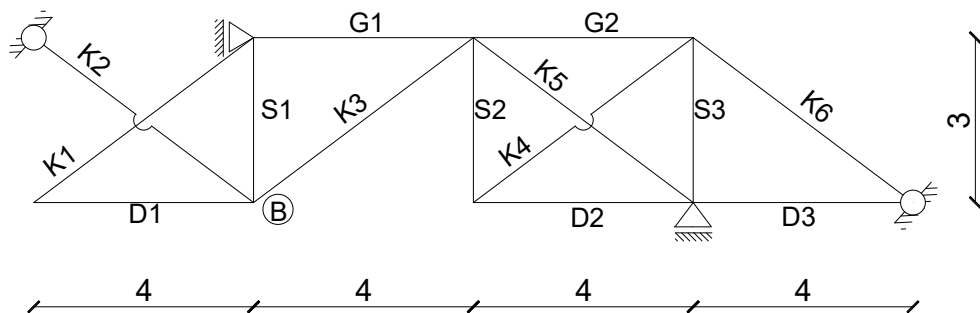


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Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:

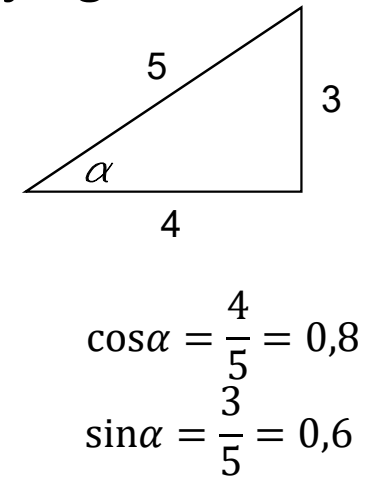
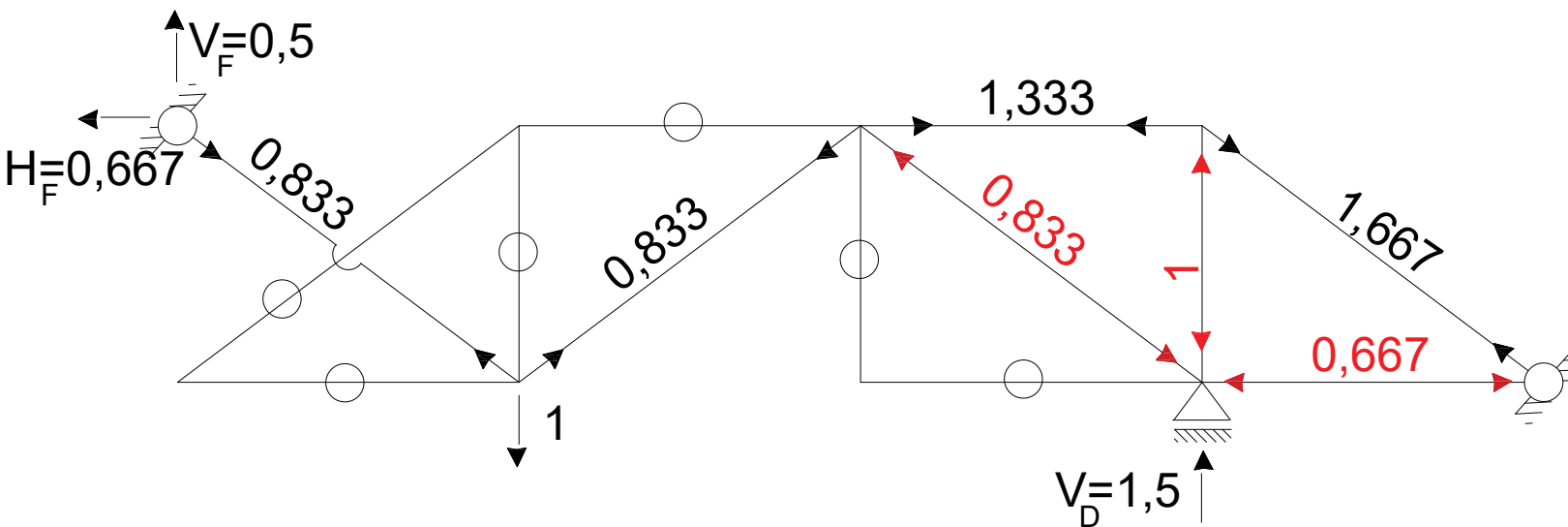


$$\sum M_H^L = -1 \cdot 4 - V_F \cdot 8 = 0 \rightarrow V_F = 0,5$$

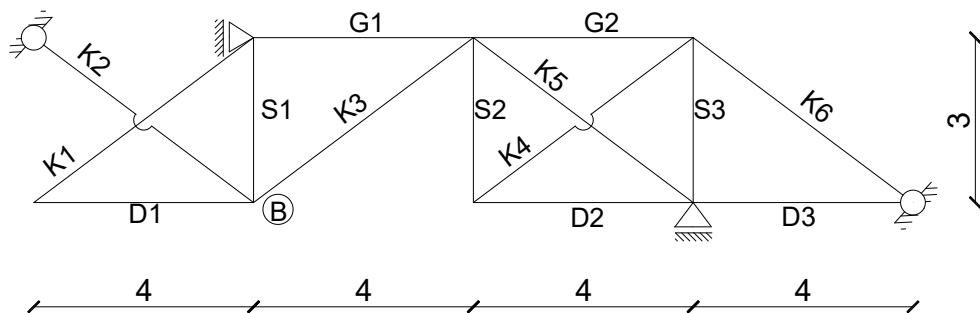


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Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:

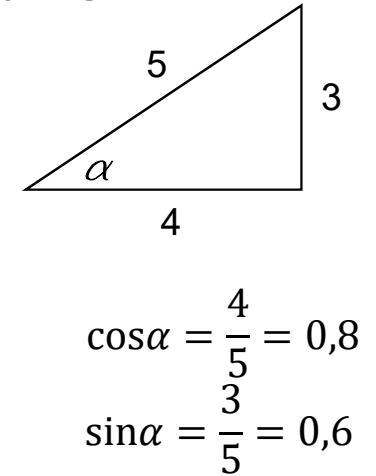
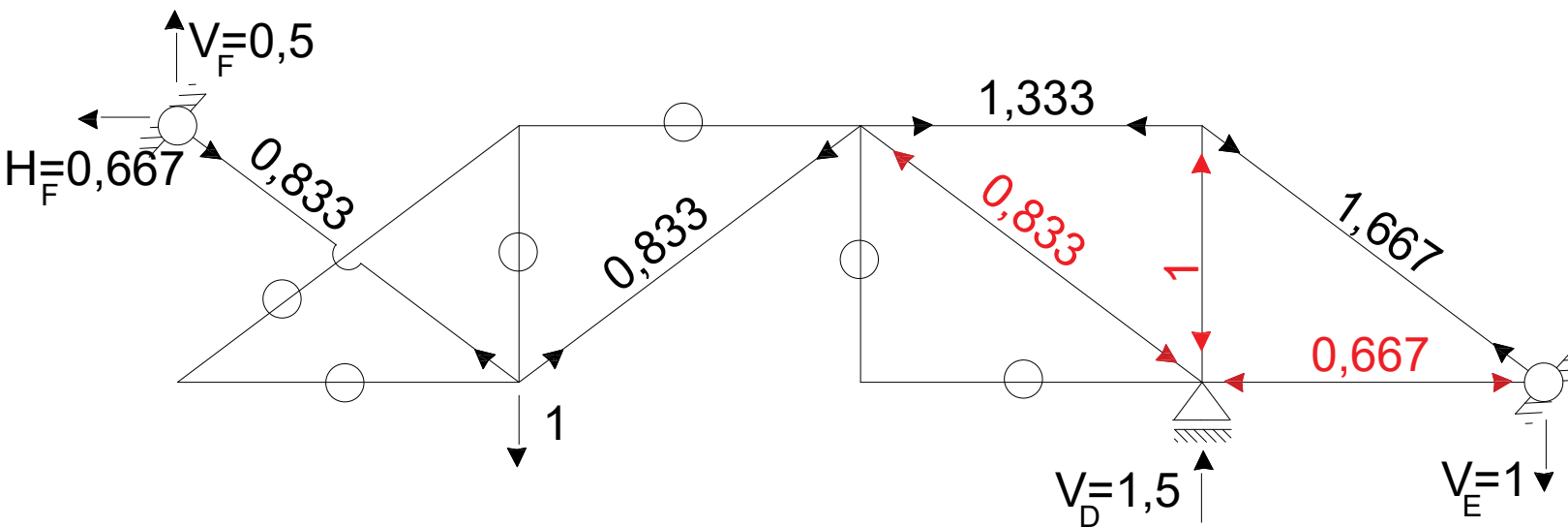


$$\sum M_H^L = -1 \cdot 4 - V_F \cdot 8 = 0 \rightarrow V_F = 0,5$$

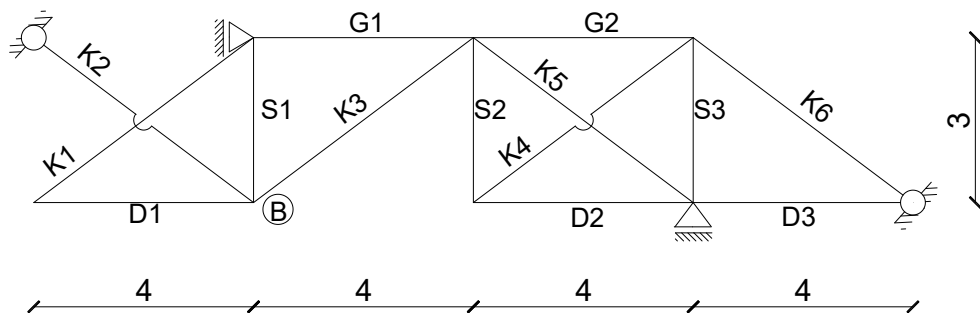


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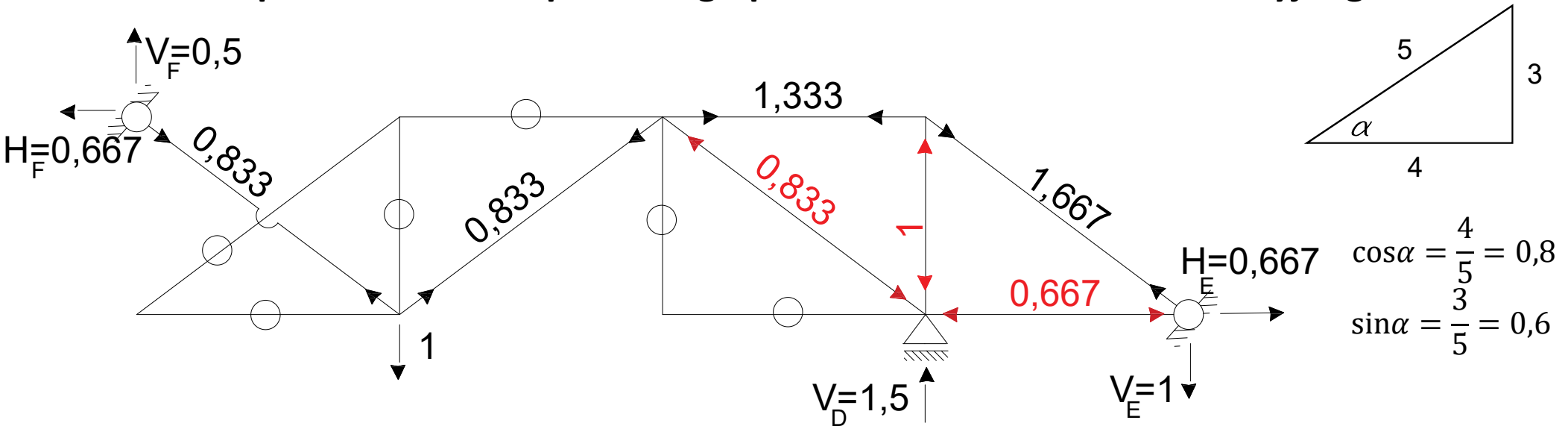
Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:



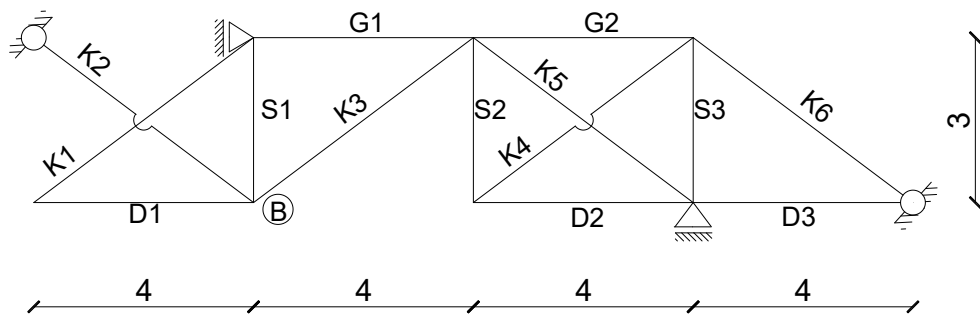
$$\sum M_H^L = -1 \cdot 4 - V_F \cdot 8 = 0 \rightarrow V_F = 0,5$$



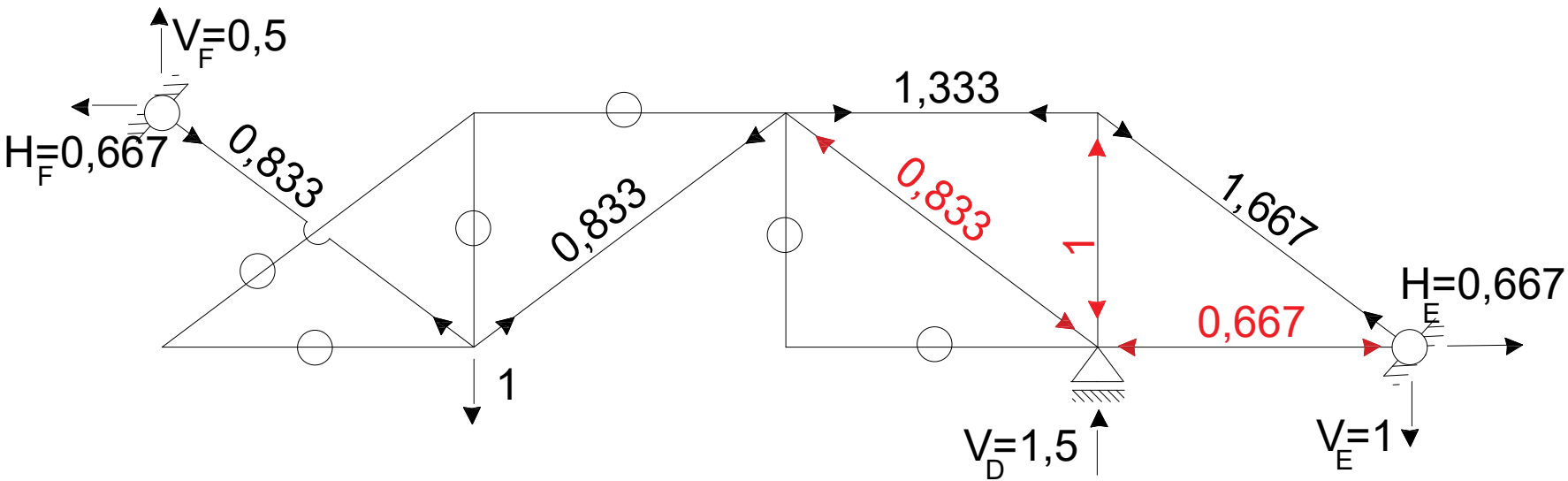
Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:



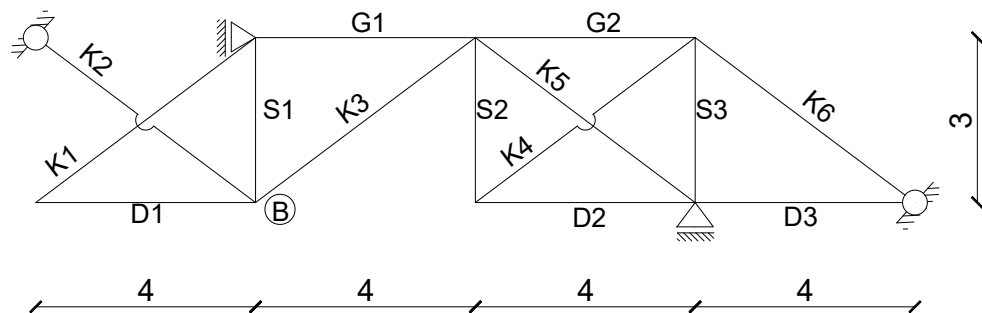
$$\sum M_H^L = -1 \cdot 4 - V_F \cdot 8 = 0 \rightarrow V_F = 0,5$$



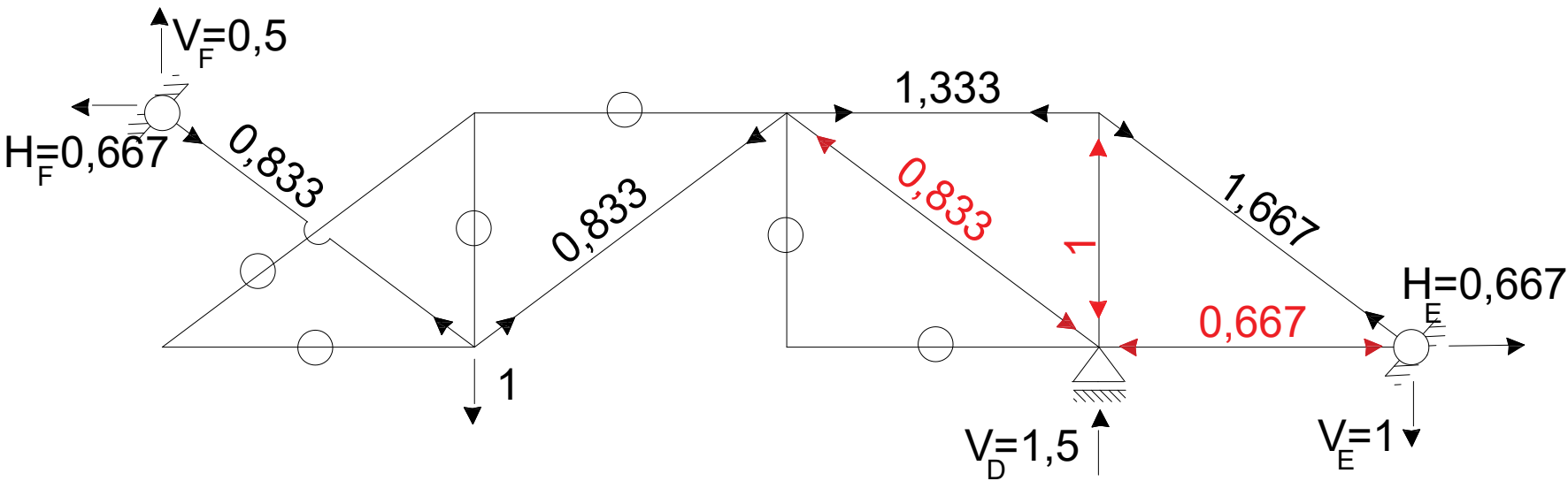
Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:



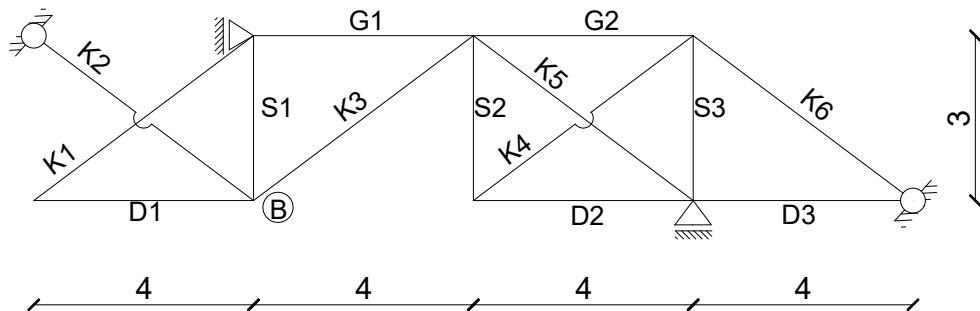
Pręt	L/EA	$\bar{N}$
D1	4	
D2	4	
D3	4	
G1	4	
G2	4	
S1	3	
S2	3	
S3	3	
K1	2,5	
K2	2,5	
K3	2,5	
K4	2,5	
K5	2,5	
K6	2,5	



Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:

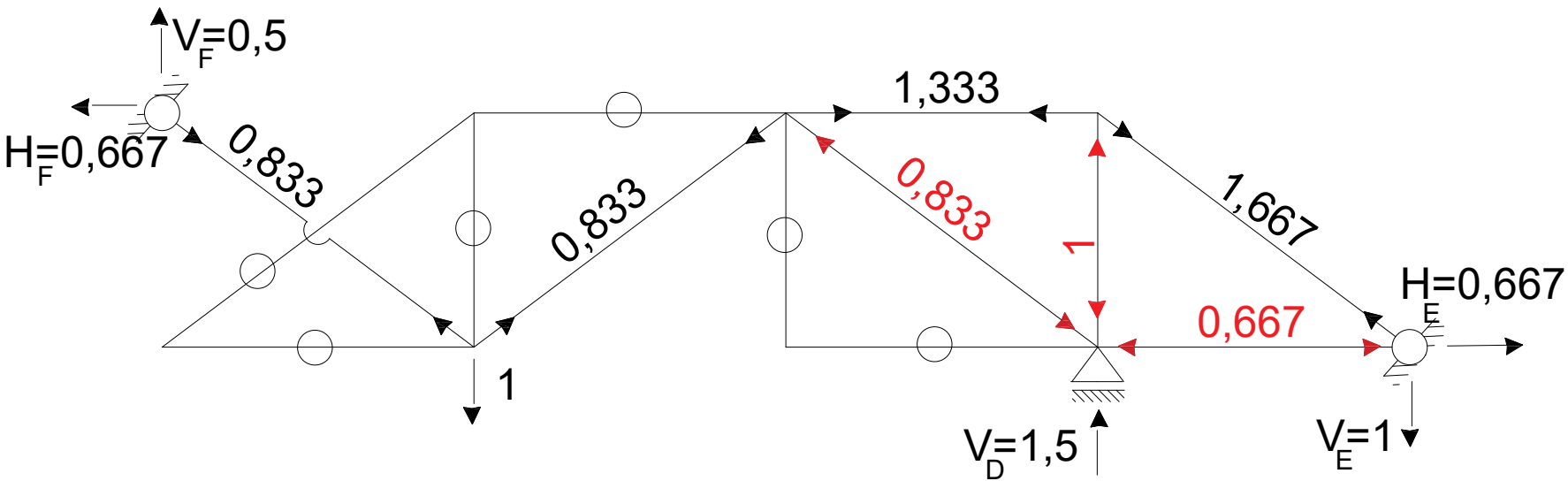


Pręt	L/EA	$\bar{N}$
D1	4	0,000
D2	4	0,000
D3	4	
G1	4	
G2	4	
S1	3	
S2	3	
S3	3	
K1	2,5	
K2	2,5	
K3	2,5	
K4	2,5	
K5	2,5	
K6	2,5	

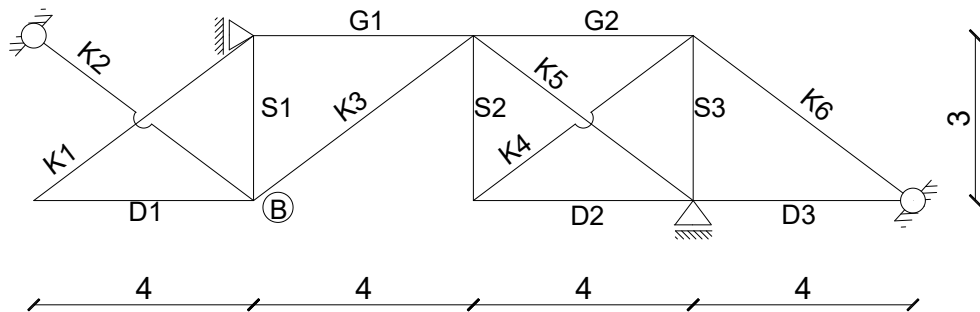


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Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:

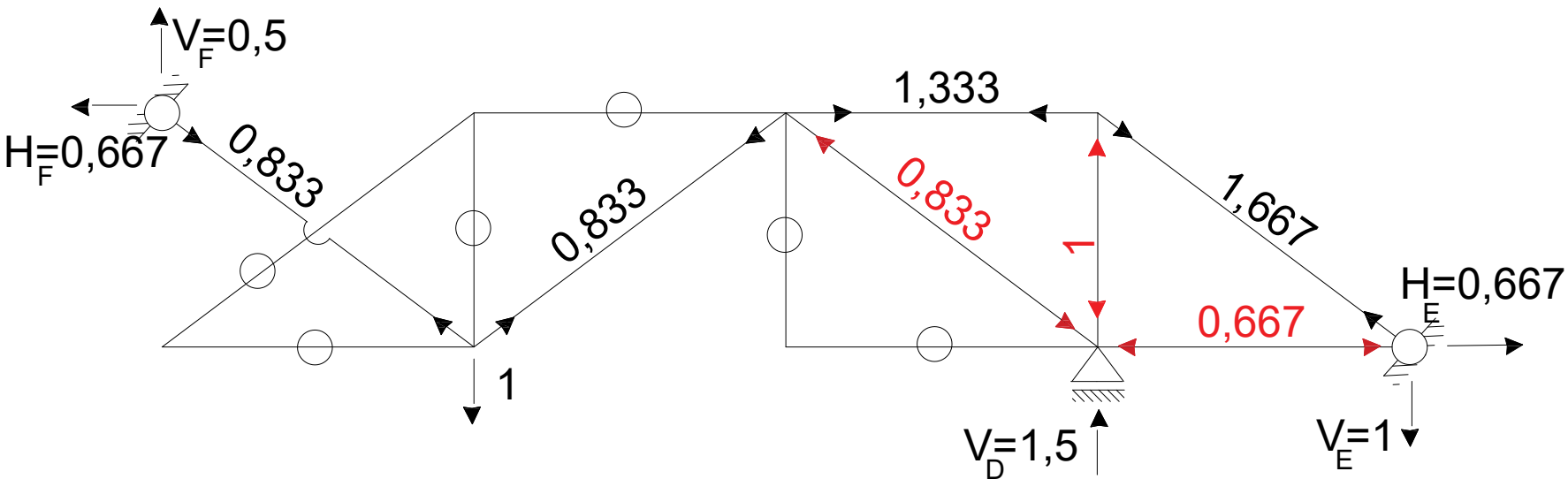


Pręt	L/EA	$\bar{N}$
D1	4	0,000
D2	4	0,000
D3	4	-0,667
G1	4	
G2	4	
S1	3	
S2	3	
S3	3	
K1	2,5	
K2	2,5	
K3	2,5	
K4	2,5	
K5	2,5	
K6	2,5	

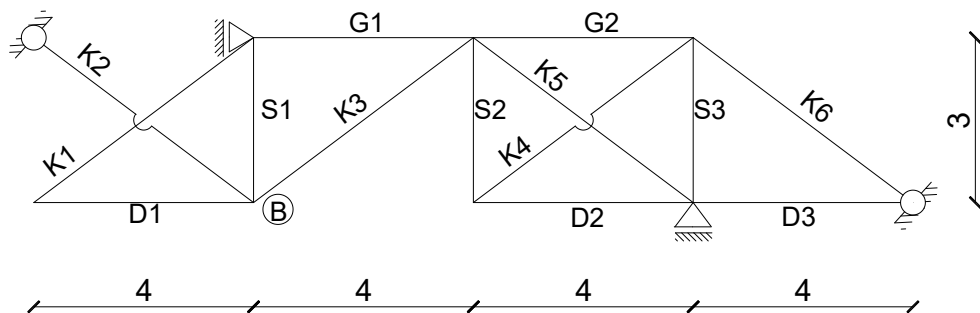


dr inż. Hanna Weber

Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:

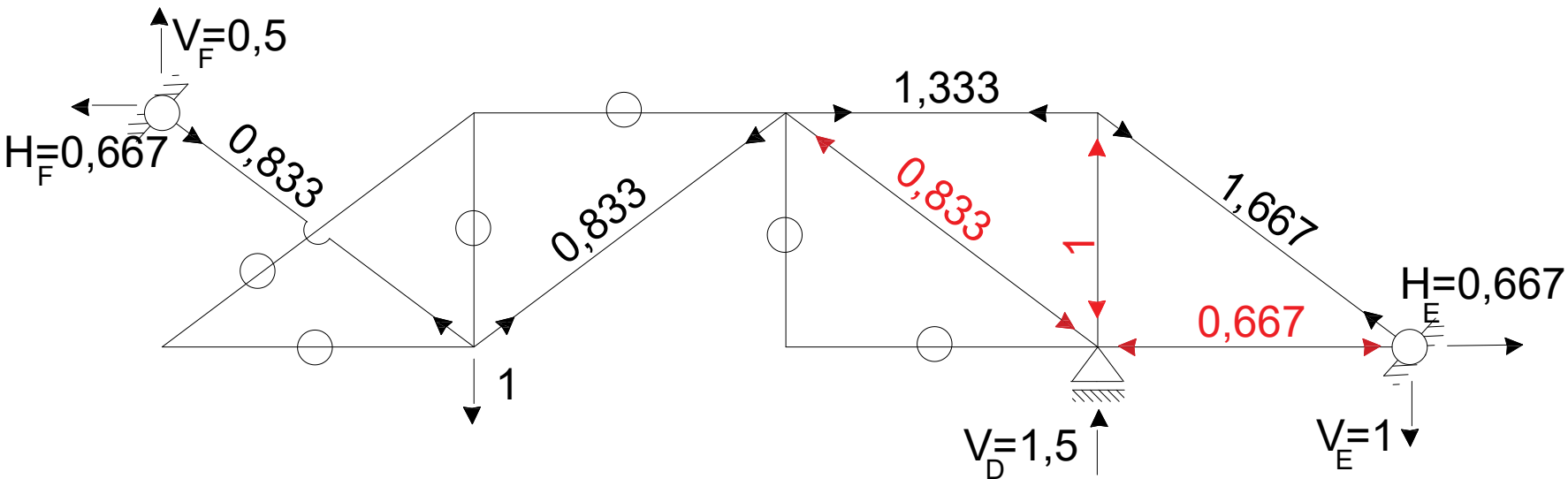


Pręt	L/EA	N
D1	4	0,000
D2	4	0,000
D3	4	-0,667
G1	4	0,000
G2	4	
S1	3	
S2	3	
S3	3	
K1	2,5	
K2	2,5	
K3	2,5	
K4	2,5	
K5	2,5	
K6	2,5	

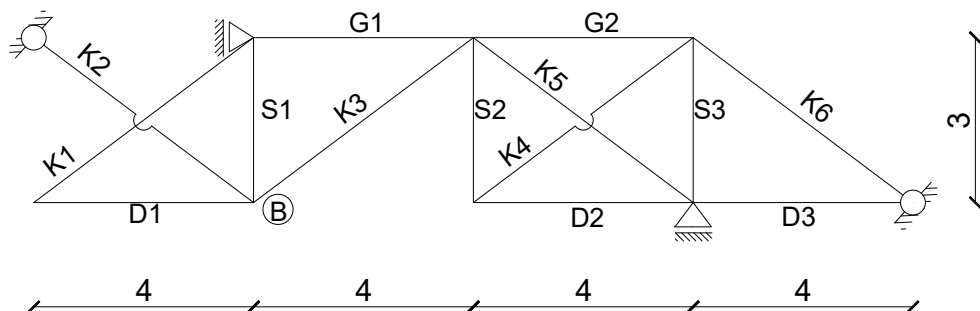


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Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:

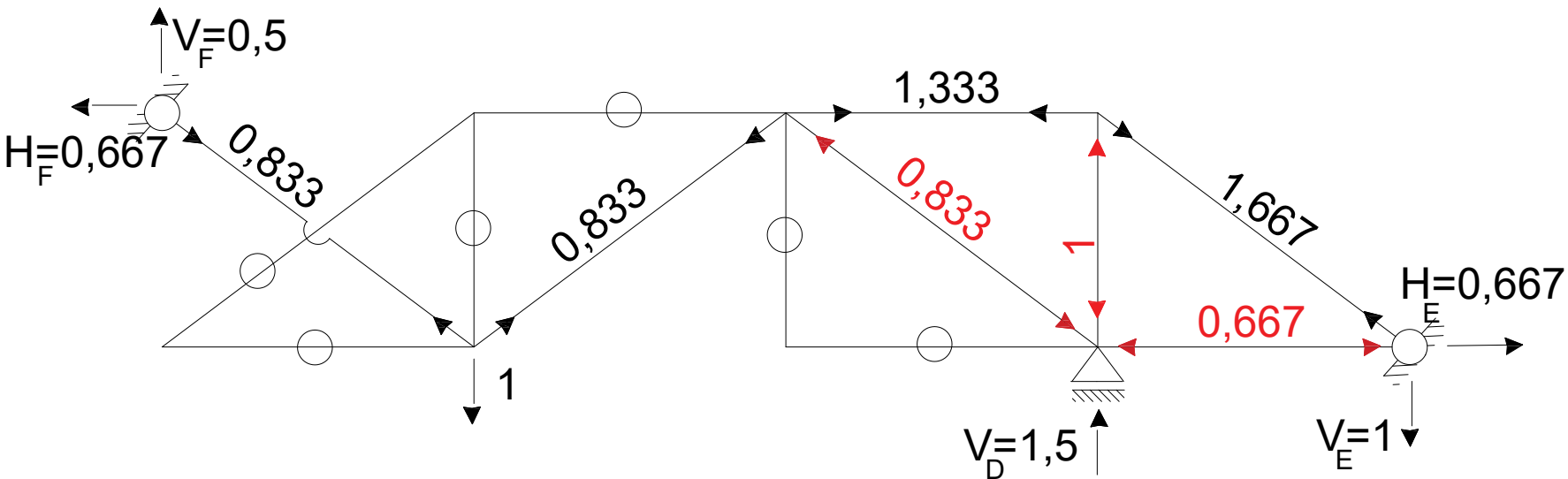


Pręt	L/EA	$\bar{N}$
D1	4	0,000
D2	4	0,000
D3	4	-0,667
G1	4	0,000
G2	4	1,333
S1	3	
S2	3	
S3	3	
K1	2,5	
K2	2,5	
K3	2,5	
K4	2,5	
K5	2,5	
K6	2,5	

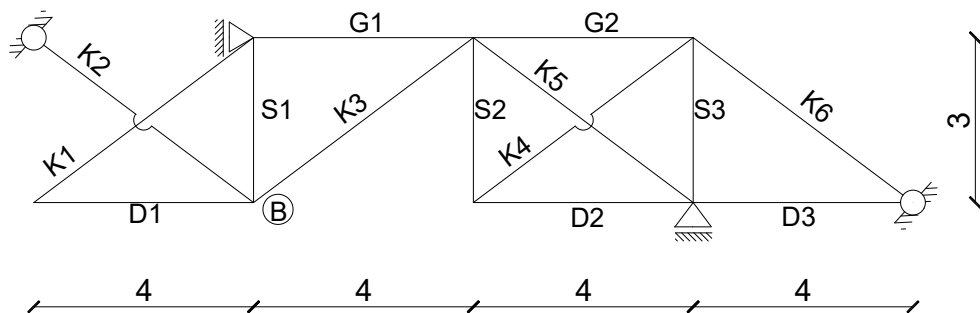


dr inż. Hanna Weber

Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:

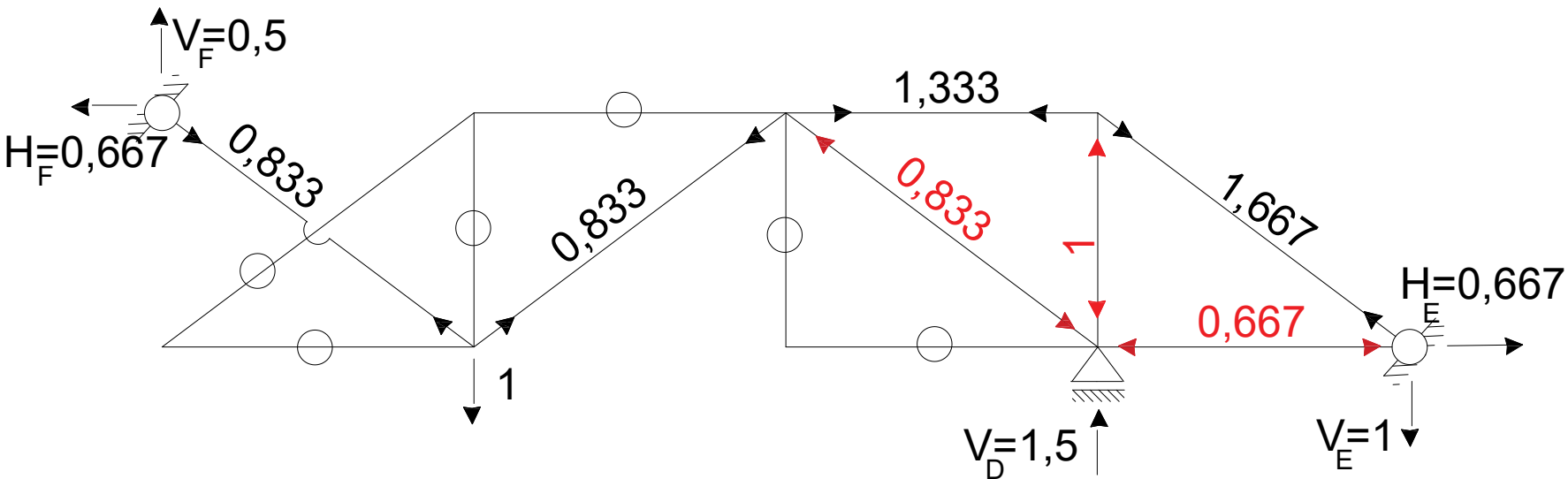


Pręt	L/EA	$\bar{N}$
D1	4	0,000
D2	4	0,000
D3	4	-0,667
G1	4	0,000
G2	4	1,333
S1	3	0,000
S2	3	0,000
S3	3	
K1	2,5	
K2	2,5	
K3	2,5	
K4	2,5	
K5	2,5	
K6	2,5	

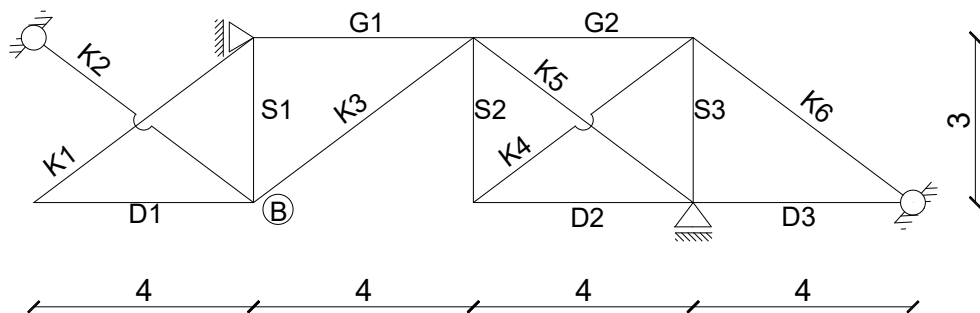


dr inż. Hanna Weber

Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:

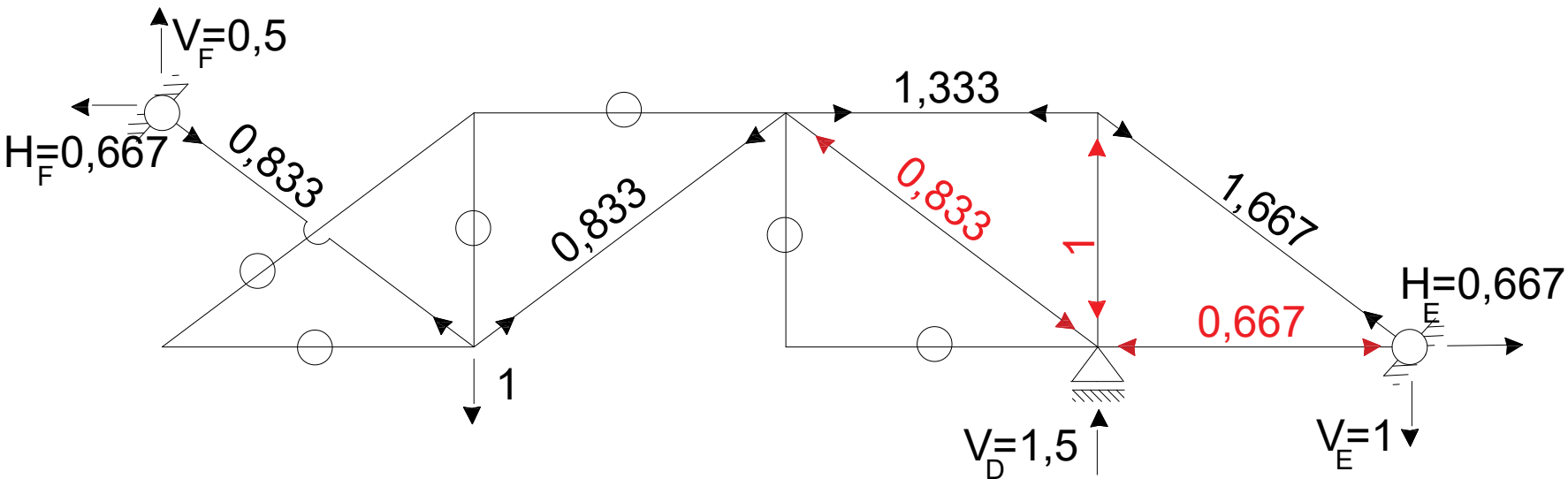


Pręt	L/EA	$\bar{N}$
D1	4	0,000
D2	4	0,000
D3	4	-0,667
G1	4	0,000
G2	4	1,333
S1	3	0,000
S2	3	0,000
S3	3	-1,000
K1	2,5	
K2	2,5	
K3	2,5	
K4	2,5	
K5	2,5	
K6	2,5	

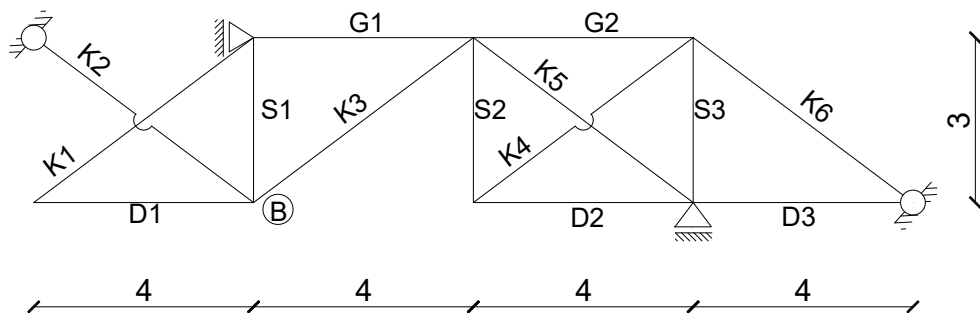


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Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:

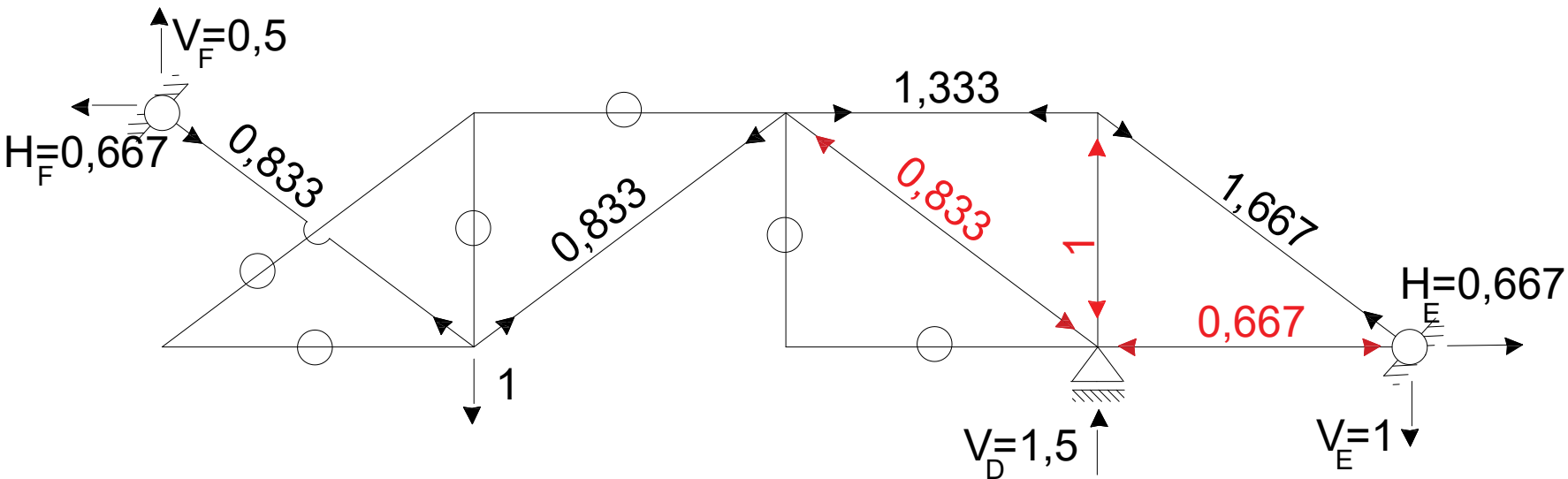


Pręt	L/EA	$\bar{N}$
D1	4	0,000
D2	4	0,000
D3	4	-0,667
G1	4	0,000
G2	4	1,333
S1	3	0,000
S2	3	0,000
S3	3	-1,000
K1	2,5	0,000
K2	2,5	
K3	2,5	
K4	2,5	
K5	2,5	
K6	2,5	

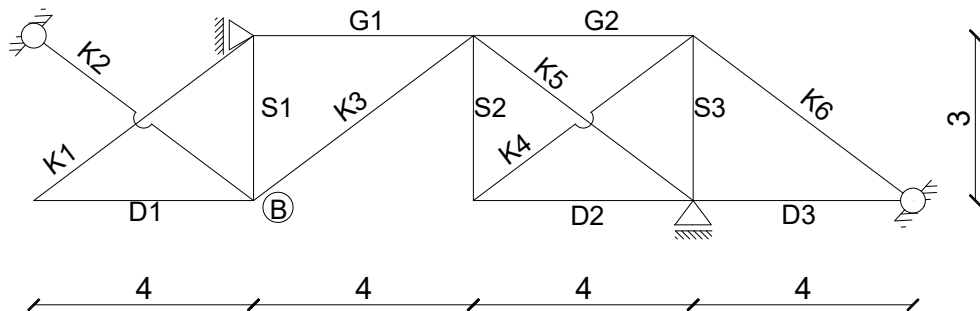


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Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:

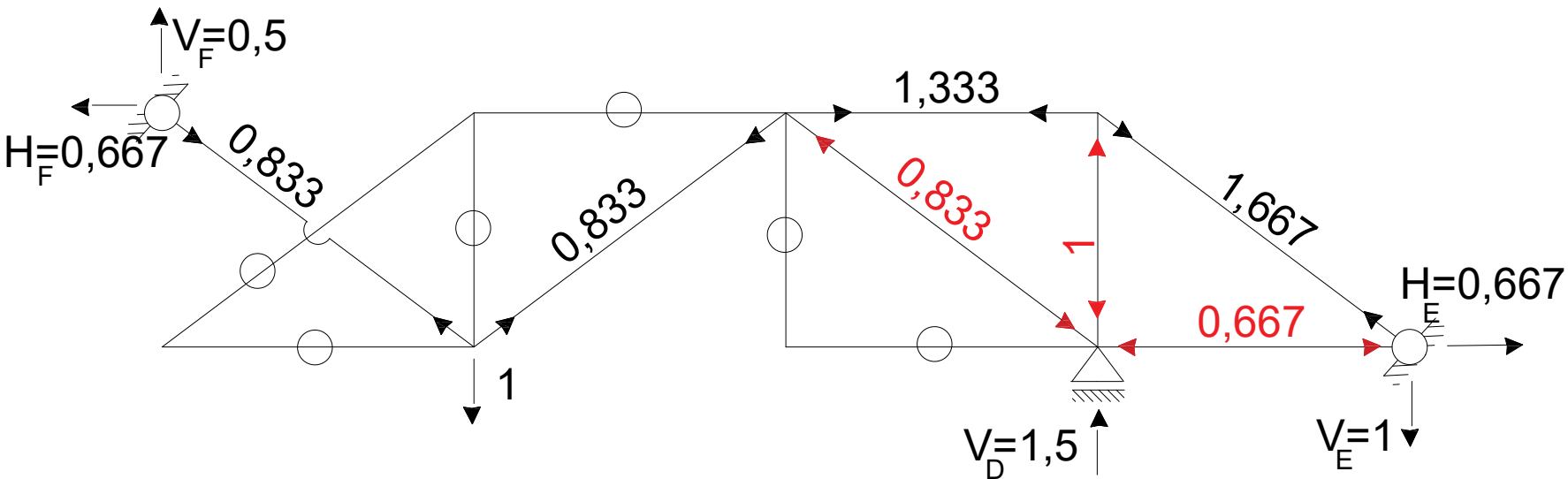


Pręt	L/EA	$\bar{N}$
D1	4	0,000
D2	4	0,000
D3	4	-0,667
G1	4	0,000
G2	4	1,333
S1	3	0,000
S2	3	0,000
S3	3	-1,000
K1	2,5	0,000
K2	2,5	0,833
K3	2,5	
K4	2,5	
K5	2,5	
K6	2,5	

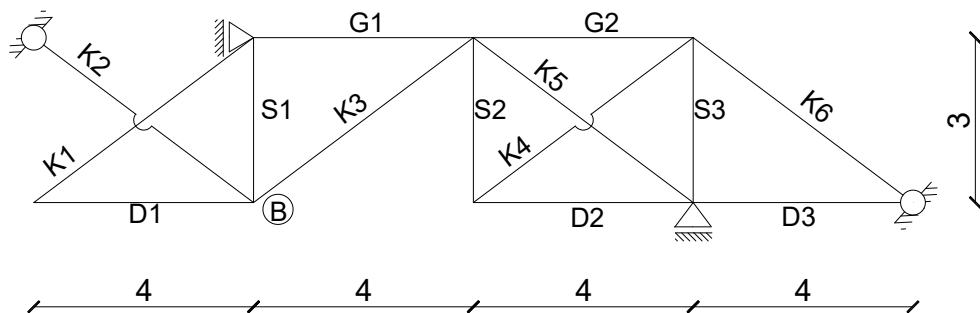


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Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:

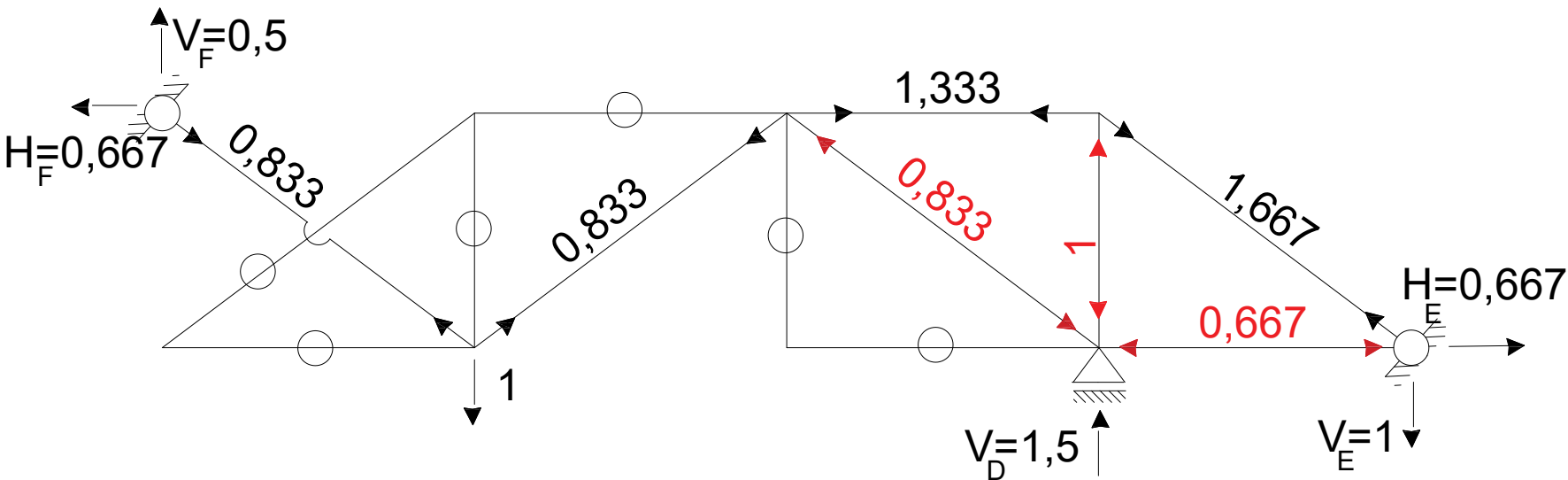


Pręt	L/EA	$\bar{N}$
D1	4	0,000
D2	4	0,000
D3	4	-0,667
G1	4	0,000
G2	4	1,333
S1	3	0,000
S2	3	0,000
S3	3	-1,000
K1	2,5	0,000
K2	2,5	0,833
K3	2,5	0,833
K4	2,5	
K5	2,5	
K6	2,5	

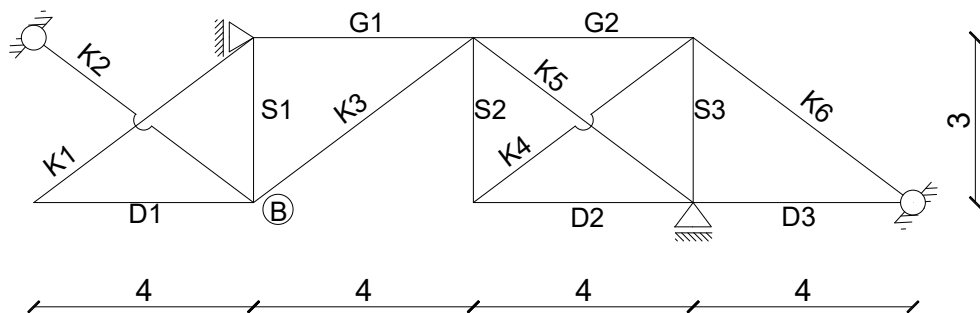


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Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:

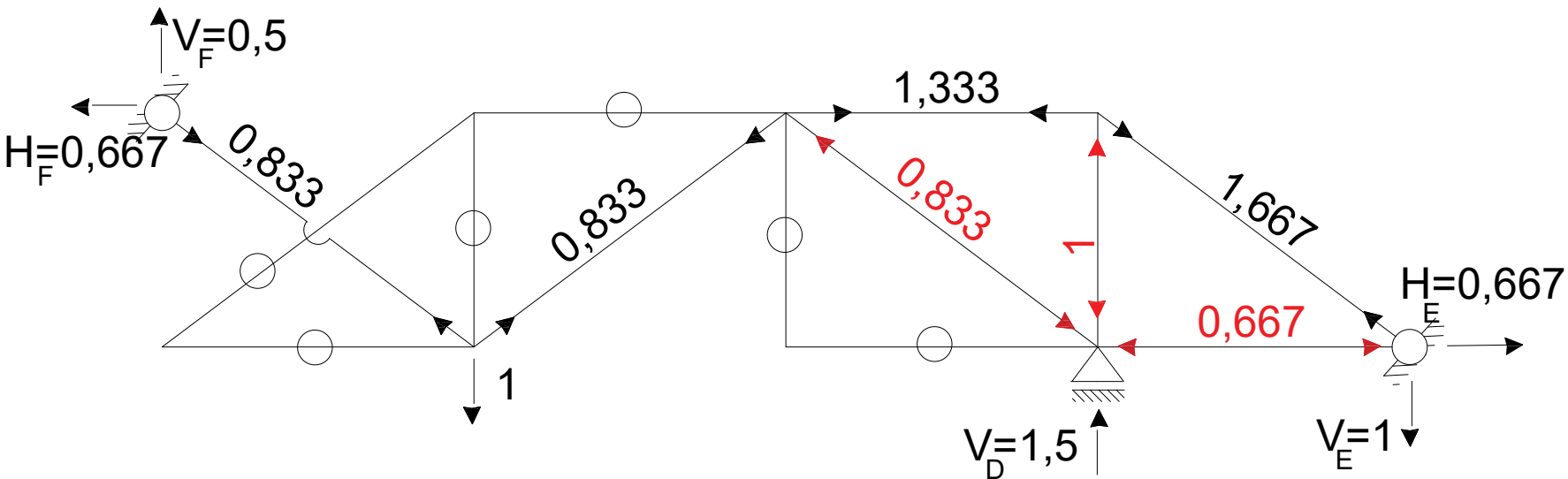


Pręt	L/EA	$\bar{N}$
D1	4	0,000
D2	4	0,000
D3	4	-0,667
G1	4	0,000
G2	4	1,333
S1	3	0,000
S2	3	0,000
S3	3	-1,000
K1	2,5	0,000
K2	2,5	0,833
K3	2,5	0,833
K4	2,5	0,000
K5	2,5	
K6	2,5	

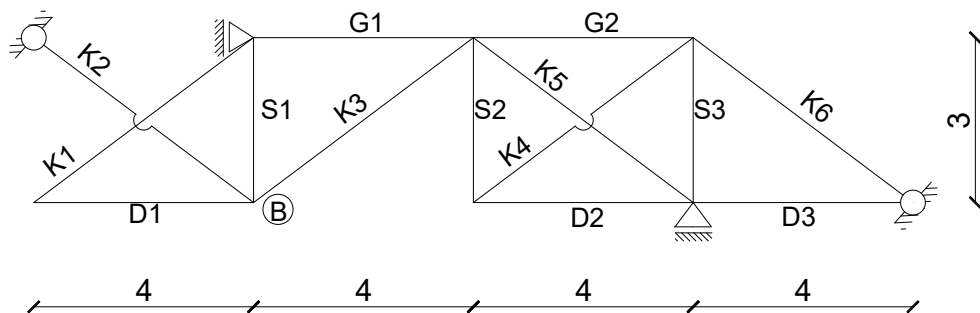


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Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:

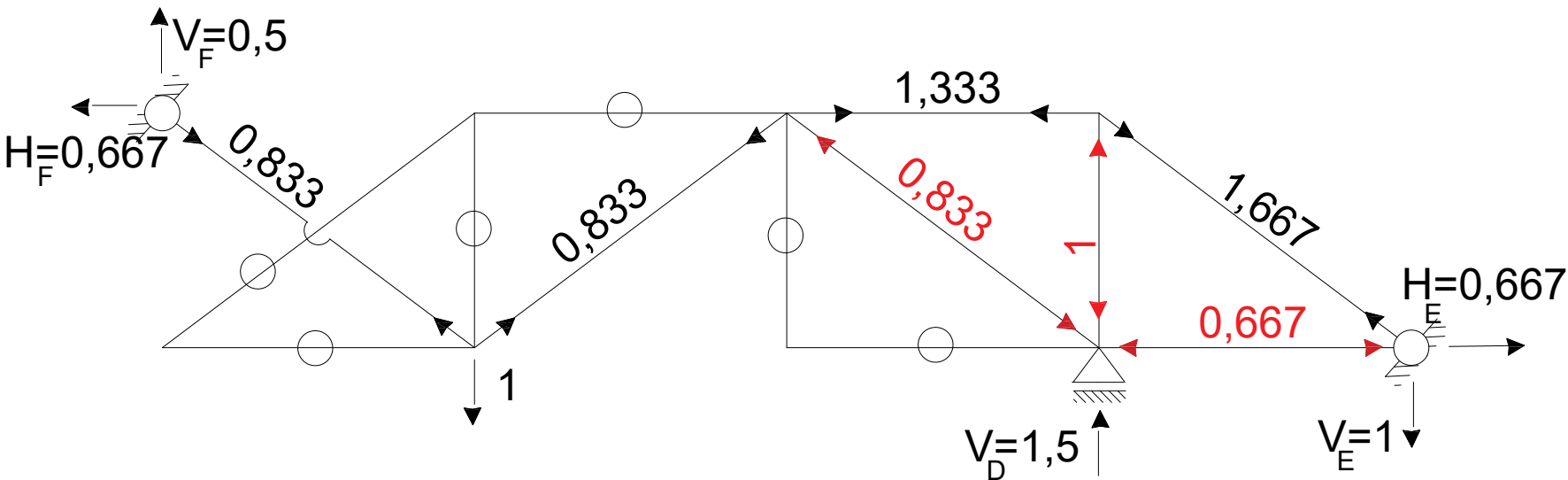


Pręt	L/EA	$\bar{N}$
D1	4	0,000
D2	4	0,000
D3	4	-0,667
G1	4	0,000
G2	4	1,333
S1	3	0,000
S2	3	0,000
S3	3	-1,000
K1	2,5	0,000
K2	2,5	0,833
K3	2,5	0,833
K4	2,5	0,000
K5	2,5	-0,833
K6	2,5	

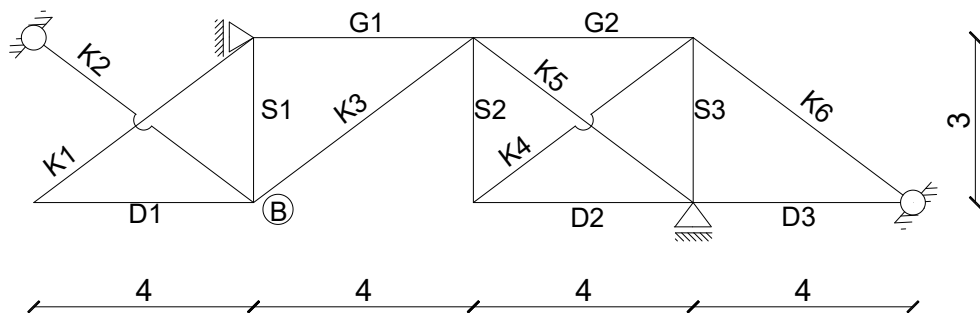


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Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:



Pręt	L/EA	$\bar{N}$
D1	4	0,000
D2	4	0,000
D3	4	-0,667
G1	4	0,000
G2	4	1,333
S1	3	0,000
S2	3	0,000
S3	3	-1,000
K1	2,5	0,000
K2	2,5	0,833
K3	2,5	0,833
K4	2,5	0,000
K5	2,5	-0,833
K6	2,5	1,667



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Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:

Pręt	L/EA	$\bar{N}$	N	$\bar{N} \cdot N \cdot L/EA$
D1	4	0,000	-24,000	
D2	4	0,000	-5,857	
D3	4	-0,667	-24,000	
G1	4	0,000	-15,942	
G2	4	1,333	2,201	
S1	3	0,000	-18,000	
S2	3	0,000	-4,393	
S3	3	-1,000	-10,437	
K1	2,5	0,000	30,000	
K2	2,5	0,833	30,000	
K3	2,5	0,833	0,000	
K4	2,5	0,000	7,322	
K5	2,5	-0,833	-22,678	
K6	2,5	1,667	10,073	

Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:

Pręt	L/EA	$\bar{N}$	N	$\bar{N} * N * L / EA$
D1	4	0,000	-24,000	0,000
D2	4	0,000	-5,857	0,000
D3	4	-0,667	-24,000	
G1	4	0,000	-15,942	
G2	4	1,333	2,201	
S1	3	0,000	-18,000	
S2	3	0,000	-4,393	
S3	3	-1,000	-10,437	
K1	2,5	0,000	30,000	
K2	2,5	0,833	30,000	
K3	2,5	0,833	0,000	
K4	2,5	0,000	7,322	
K5	2,5	-0,833	-22,678	
K6	2,5	1,667	10,073	

Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:

Pręt	L/EA	$\bar{N}$	N	$\bar{N} \cdot N \cdot L/EA$
D1	4	0,000	-24,000	0,000
D2	4	0,000	-5,857	0,000
D3	4	-0,667	-24,000	64,000
G1	4	0,000	-15,942	
G2	4	1,333	2,201	
S1	3	0,000	-18,000	
S2	3	0,000	-4,393	
S3	3	-1,000	-10,437	
K1	2,5	0,000	30,000	
K2	2,5	0,833	30,000	
K3	2,5	0,833	0,000	
K4	2,5	0,000	7,322	
K5	2,5	-0,833	-22,678	
K6	2,5	1,667	10,073	

Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:

Pręt	L/EA	$\bar{N}$	N	$\bar{N} \cdot N \cdot L/EA$
D1	4	0,000	-24,000	0,000
D2	4	0,000	-5,857	0,000
D3	4	-0,667	-24,000	64,000
G1	4	0,000	-15,942	0,000
G2	4	1,333	2,201	
S1	3	0,000	-18,000	
S2	3	0,000	-4,393	
S3	3	-1,000	-10,437	
K1	2,5	0,000	30,000	
K2	2,5	0,833	30,000	
K3	2,5	0,833	0,000	
K4	2,5	0,000	7,322	
K5	2,5	-0,833	-22,678	
K6	2,5	1,667	10,073	

Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:

Pręt	L/EA	$\bar{N}$	N	$\bar{N} * N * L / EA$
D1	4	0,000	-24,000	0,000
D2	4	0,000	-5,857	0,000
D3	4	-0,667	-24,000	64,000
G1	4	0,000	-15,942	0,000
G2	4	1,333	2,201	11,740
S1	3	0,000	-18,000	
S2	3	0,000	-4,393	
S3	3	-1,000	-10,437	
K1	2,5	0,000	30,000	
K2	2,5	0,833	30,000	
K3	2,5	0,833	0,000	
K4	2,5	0,000	7,322	
K5	2,5	-0,833	-22,678	
K6	2,5	1,667	10,073	

Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:

Pręt	L/EA	$\bar{N}$	N	$\bar{N} \cdot N \cdot L/EA$
D1	4	0,000	-24,000	0,000
D2	4	0,000	-5,857	0,000
D3	4	-0,667	-24,000	64,000
G1	4	0,000	-15,942	0,000
G2	4	1,333	2,201	11,740
S1	3	0,000	-18,000	0,000
S2	3	0,000	-4,393	0,000
S3	3	-1,000	-10,437	
K1	2,5	0,000	30,000	
K2	2,5	0,833	30,000	
K3	2,5	0,833	0,000	
K4	2,5	0,000	7,322	
K5	2,5	-0,833	-22,678	
K6	2,5	1,667	10,073	

Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:

Pręt	L/EA	$\bar{N}$	N	$\bar{N} \cdot N \cdot L/EA$
D1	4	0,000	-24,000	0,000
D2	4	0,000	-5,857	0,000
D3	4	-0,667	-24,000	64,000
G1	4	0,000	-15,942	0,000
G2	4	1,333	2,201	11,740
S1	3	0,000	-18,000	0,000
S2	3	0,000	-4,393	0,000
S3	3	-1,000	-10,437	31,310
K1	2,5	0,000	30,000	
K2	2,5	0,833	30,000	
K3	2,5	0,833	0,000	
K4	2,5	0,000	7,322	
K5	2,5	-0,833	-22,678	
K6	2,5	1,667	10,073	

Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:

Pręt	L/EA	$\bar{N}$	N	$\bar{N} \cdot N \cdot L/EA$
D1	4	0,000	-24,000	0,000
D2	4	0,000	-5,857	0,000
D3	4	-0,667	-24,000	64,000
G1	4	0,000	-15,942	0,000
G2	4	1,333	2,201	11,740
S1	3	0,000	-18,000	0,000
S2	3	0,000	-4,393	0,000
S3	3	-1,000	-10,437	31,310
K1	2,5	0,000	30,000	0,000
K2	2,5	0,833	30,000	
K3	2,5	0,833	0,000	
K4	2,5	0,000	7,322	
K5	2,5	-0,833	-22,678	
K6	2,5	1,667	10,073	

Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:

Pręt	L/EA	$\bar{N}$	N	$\bar{N} \cdot N \cdot L/EA$
D1	4	0,000	-24,000	0,000
D2	4	0,000	-5,857	0,000
D3	4	-0,667	-24,000	64,000
G1	4	0,000	-15,942	0,000
G2	4	1,333	2,201	11,740
S1	3	0,000	-18,000	0,000
S2	3	0,000	-4,393	0,000
S3	3	-1,000	-10,437	31,310
K1	2,5	0,000	30,000	0,000
K2	2,5	0,833	30,000	62,500
K3	2,5	0,833	0,000	
K4	2,5	0,000	7,322	
K5	2,5	-0,833	-22,678	
K6	2,5	1,667	10,073	

Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:

Pręt	L/EA	$\bar{N}$	N	$\bar{N} \cdot N \cdot L/EA$
D1	4	0,000	-24,000	0,000
D2	4	0,000	-5,857	0,000
D3	4	-0,667	-24,000	64,000
G1	4	0,000	-15,942	0,000
G2	4	1,333	2,201	11,740
S1	3	0,000	-18,000	0,000
S2	3	0,000	-4,393	0,000
S3	3	-1,000	-10,437	31,310
K1	2,5	0,000	30,000	0,000
K2	2,5	0,833	30,000	62,500
K3	2,5	0,833	0,000	0,000
K4	2,5	0,000	7,322	0,000
K5	2,5	-0,833	-22,678	
K6	2,5	1,667	10,073	

Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:

Pręt	L/EA	$\bar{N}$	N	$\bar{N} \cdot N \cdot L/EA$
D1	4	0,000	-24,000	0,000
D2	4	0,000	-5,857	0,000
D3	4	-0,667	-24,000	64,000
G1	4	0,000	-15,942	0,000
G2	4	1,333	2,201	11,740
S1	3	0,000	-18,000	0,000
S2	3	0,000	-4,393	0,000
S3	3	-1,000	-10,437	31,310
K1	2,5	0,000	30,000	0,000
K2	2,5	0,833	30,000	62,500
K3	2,5	0,833	0,000	0,000
K4	2,5	0,000	7,322	0,000
K5	2,5	-0,833	-22,678	47,247
K6	2,5	1,667	10,073	

Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:

Pręt	L/EA	$\bar{N}$	N	$\bar{N} \cdot N \cdot L/EA$
D1	4	0,000	-24,000	0,000
D2	4	0,000	-5,857	0,000
D3	4	-0,667	-24,000	64,000
G1	4	0,000	-15,942	0,000
G2	4	1,333	2,201	11,740
S1	3	0,000	-18,000	0,000
S2	3	0,000	-4,393	0,000
S3	3	-1,000	-10,437	31,310
K1	2,5	0,000	30,000	0,000
K2	2,5	0,833	30,000	62,500
K3	2,5	0,833	0,000	0,000
K4	2,5	0,000	7,322	0,000
K5	2,5	-0,833	-22,678	47,247
K6	2,5	1,667	10,073	41,971

Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:

Pręt	L/EA	$\bar{N}$	N	$\bar{N} \cdot N \cdot L/EA$
D1	4	0,000	-24,000	0,000
D2	4	0,000	-5,857	0,000
D3	4	-0,667	-24,000	64,000
G1	4	0,000	-15,942	0,000
G2	4	1,333	2,201	11,740
S1	3	0,000	-18,000	0,000
S2	3	0,000	-4,393	0,000
S3	3	-1,000	-10,437	31,310
K1	2,5	0,000	30,000	0,000
K2	2,5	0,833	30,000	62,500
K3	2,5	0,833	0,000	0,000
K4	2,5	0,000	7,322	0,000
K5	2,5	-0,833	-22,678	47,247
K6	2,5	1,667	10,073	41,971
				258,768

Obliczenie przemieszczenia pionowego punktu B z twierdzenia redukcyjnego:

Pręt	L/EA	$\bar{N}$	N	$\bar{N} \cdot N \cdot L/EA$
D1	4	0,000	-24,000	0,000
D2	4	0,000	-5,857	0,000
D3	4	-0,667	-24,000	64,000
G1	4	0,000	-15,942	0,000
G2	4	1,333	2,201	11,740
S1	3	0,000	-18,000	0,000
S2	3	0,000	-4,393	0,000
S3	3	-1,000	-10,437	31,310
K1	2,5	0,000	30,000	0,000
K2	2,5	0,833	30,000	62,500
K3	2,5	0,833	0,000	0,000
K4	2,5	0,000	7,322	0,000
K5	2,5	-0,833	-22,678	47,247
K6	2,5	1,667	10,073	41,971
				258,768

Przemieszczenie pionowe punktu B wynosi $v_B = 258,768/EA$