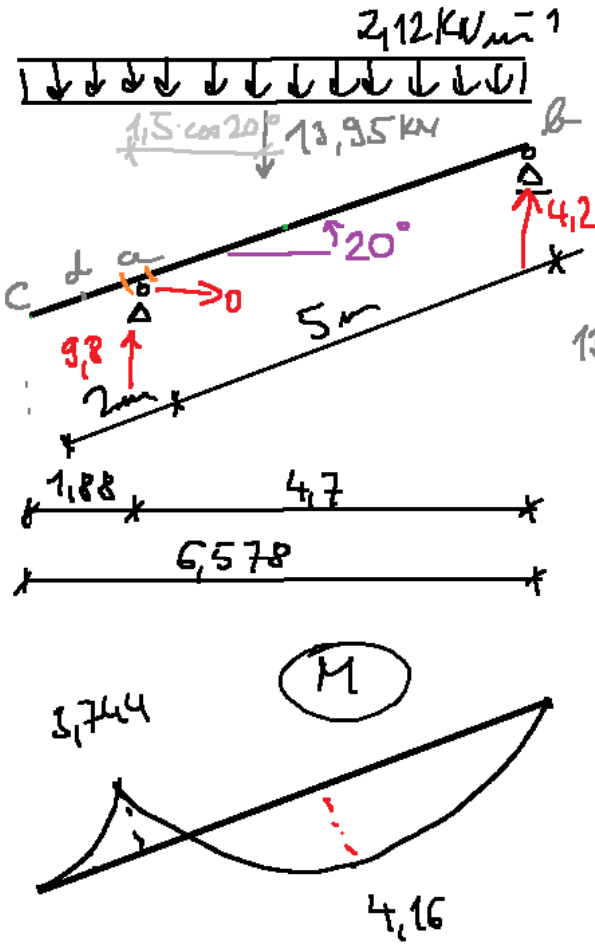
ZÁKLADY STAVEBNÍ MECHANIKY

BDA001

Rovinný šikmý nosník s převislým koncem, se spojitým zatížením, silami a momenty, reakce a diagramy vnitřních sil a momentů.

Zdeněk Kala



$\Sigma M_a = 0 \quad 2{,}12 \cdot 7 \cdot \cos 20° \cdot 1{,}5 \cdot \cos 20° + R_b \cdot 5 \cdot \cos 20° \Rightarrow R_b = 4{,}2\,KN$

$1{,}5 \cdot \cos 20 - 2 \cdot \cos 20° = 1{,}5 \cdot \cos 20°$

$\Sigma M_b = 0 \quad -R_a \cdot 4{,}7 + 2{,}12 \cdot 6{,}578 \cdot \left(\frac{6{,}578}{2} - 1{,}88\right) = 0 \quad R_a = 9{,}8\,KN$

$\Sigma F_y = 0 \quad 9{,}8 - 2{,}12 \cdot 6{,}578 + 4{,}2 = 0$ ✓

$13{,}95 \cdot \cos 20° = 13{,}1\,KN$

$13{,}95 \cdot \sin 20° = 4{,}77$

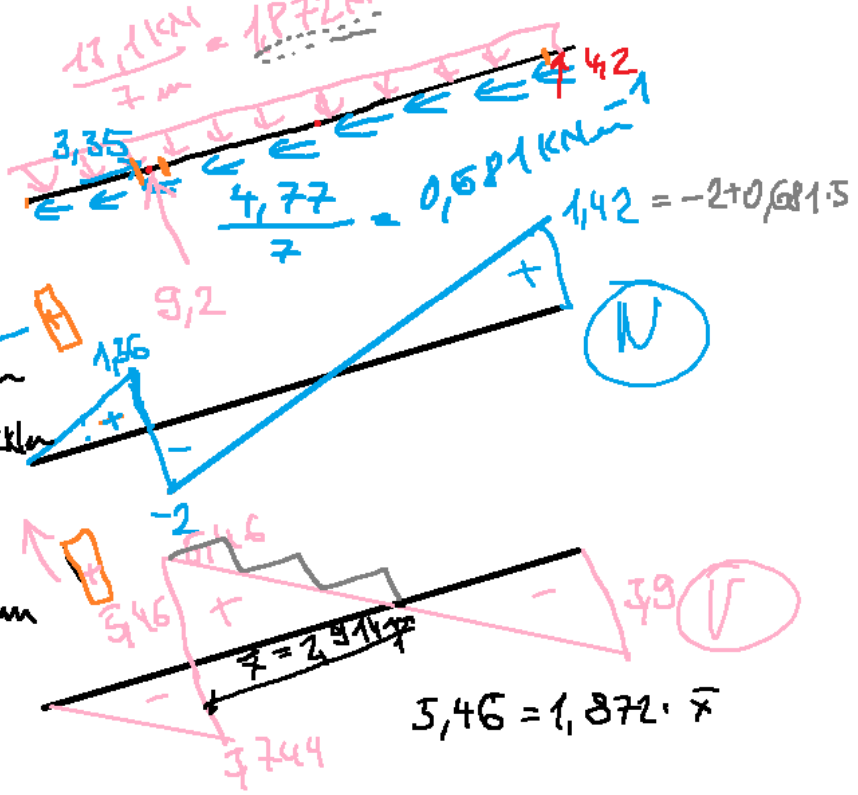
$9{,}8 \cdot \cos 20° = 9{,}2\,KN$

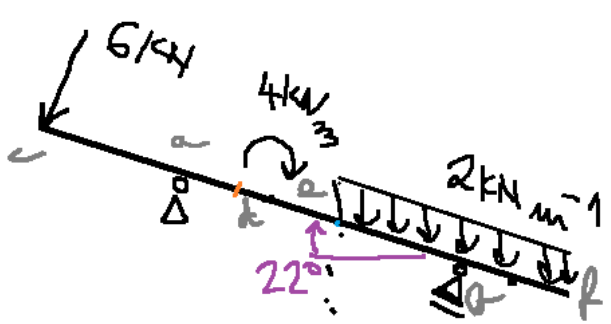
$9{,}8 \cdot \sin 20° = 3{,}35\,KN$

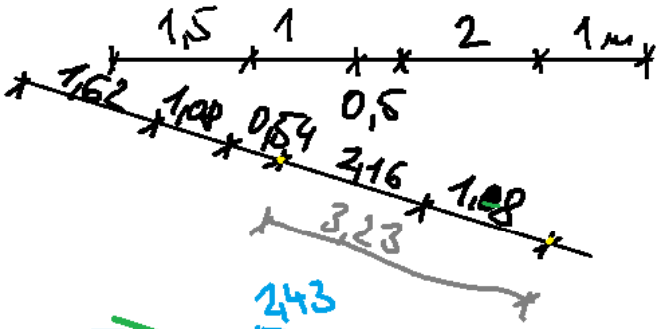
$M_a = 1{,}872 \cdot 2 \cdot 1 = 3{,}744\,KNm$

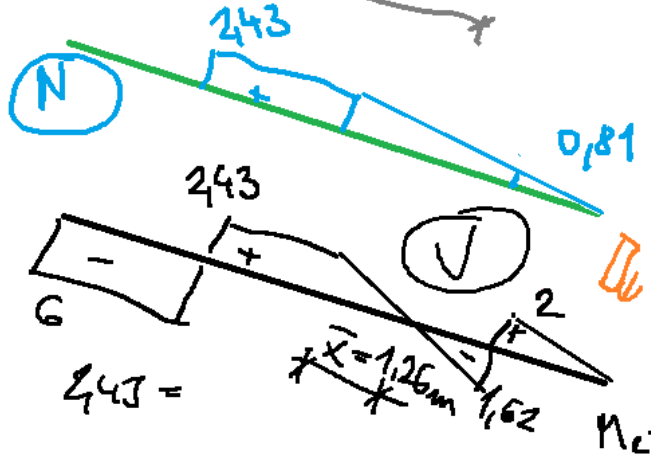
$M_d = 1{,}872 \cdot 1 \cdot 0{,}5 = 0{,}936\,KNm$

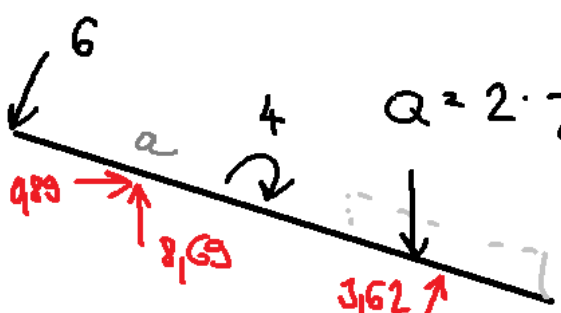
$M_{max} = -1{,}872 \cdot 4{,}914 \cdot \frac{4{,}914}{2} + 9{,}2 \cdot 2{,}914 = 4{,}16\,KNm$



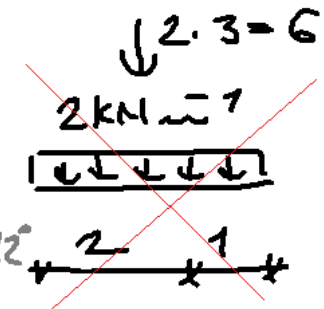








$$Q = 2 \cdot \frac{3}{\cos 22°} = 6{,}47\ \text{kN}$$

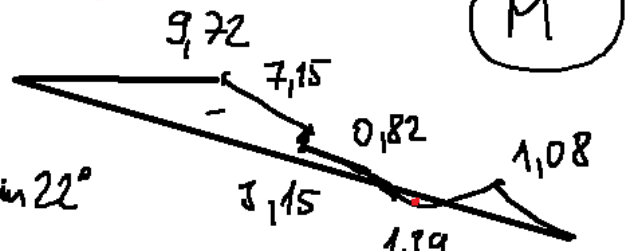


$\Sigma M_B = 0 \quad 6 \cdot 5{,}14 - 4 + 6{,}47 \cdot 0{,}5 - R_a \cdot 3{,}5 - 0{,}89 \cdot 1{,}41 = 0 \quad R_a = 8{,}69\ \text{kN}$

$\Sigma M_a = 0 \quad 6 \cdot 1{,}62 - 6{,}47 \cdot 3 + R_a \cdot 3{,}78 - 4 = 0 \quad R_b = 3{,}62\ \text{kN}$

$\Sigma F_x = 0 \quad -6 \cdot \sin 22 + H_a + 3{,}62 \cdot \sin 22° = 0 \quad H_a = 0{,}89\ \text{kN}$

$\Sigma F_y = 0 \quad -6 \cdot \cos 22° + 8{,}69 - 6{,}47 + 3{,}62 \cdot \cos 22° = 0$ ✓



$M_d = -6 \cdot (1{,}62 + 1{,}08) + 8{,}69 \cdot 1 + 0{,}89 \cdot 1{,}08 \cdot \sin 22°$

$M_c = -6 \cdot (1{,}62 + 1{,}08 + 0{,}54) + 8{,}69 \cdot (1{,}08 + 0{,}54) + 0{,}89 \cdot (1{,}08 + 0{,}54) \cdot \sin 22° + 4 = 0{,}12$