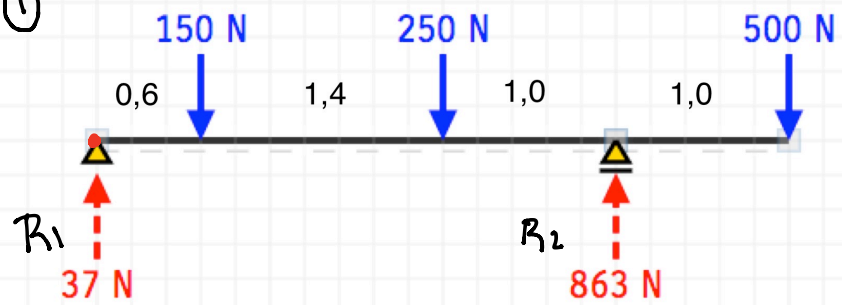
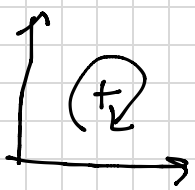
①



Para todos os casos será adotado centro em R_1 e



$\Sigma F_v = 0 \Rightarrow R_1 + R_2 = 150 + 250 + 500$

$R_1 + R_2 = 900$

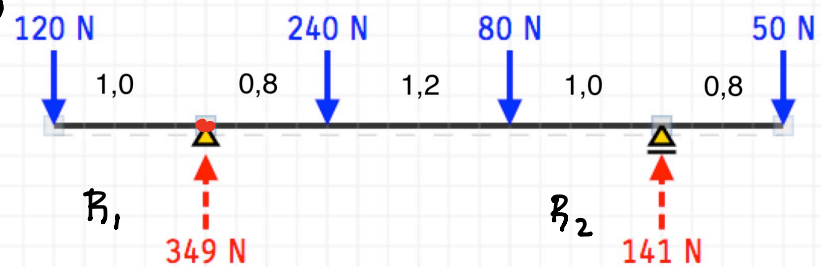
$\Sigma M_t = 0 \Rightarrow 150 \cdot 0{,}6 + 250 \cdot 2{,}0 - R_2 \cdot 3{,}0 + 500 \cdot 4 = 0$

$90 + 500 + 2000 = 3{,}0\, R_2$

$2590 = 3{,}0\, R_2 \Rightarrow R_2 = \frac{2590}{3{,}0} \Rightarrow \boxed{R_2 = 863\ N}$

$R_1 = 900 - 863 \Rightarrow \boxed{R_1 = 37\ N}$

②



$\Sigma F_v = 0 \Rightarrow R_1 + R_2 = 120 + 240 + 80 + 50$

$R_1 + R_2 = 490\ N$

$\Sigma M_t = 0 \Rightarrow$

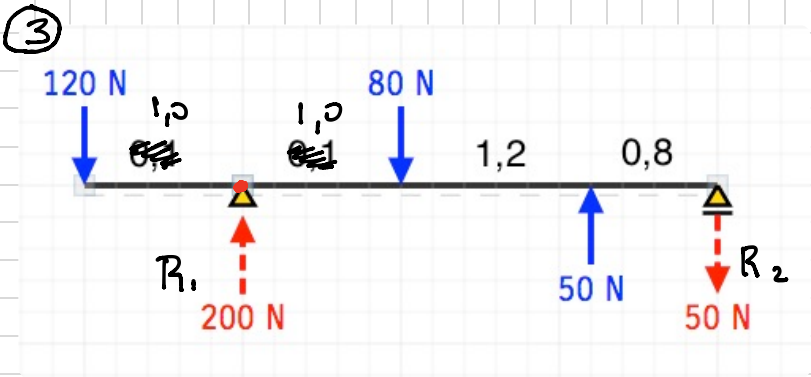
$-120 \times 1{,}0 + 240 \times 0{,}8 + 80 \times 2{,}0 - R_2 \times 3{,}0 + 50 \times 3{,}8 = 0$

$-120 + 192 + 160 + 190 = 3{,}0\, R_2$

$422 = 3{,}0\, R_2 \Rightarrow R_2 = \frac{422}{3} \Rightarrow \boxed{R_2 = 141\ N}$

$R_1 = 490 - 141 \Rightarrow \boxed{R_1 = 349\ N}$

(3)



$\Sigma F_v = 0 \Rightarrow \quad R_1 + R_2 + 50 = 120 + 80$

$R_1 + R_2 = 200 - 50 \Rightarrow R_1 + R_2 = 150$

$\Sigma M_1 = 0 \Rightarrow$

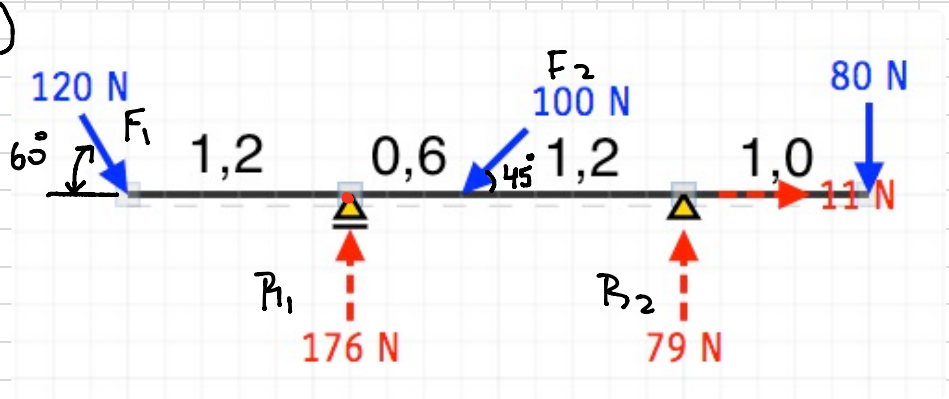
$-120 \times 1{,}0 + 80 \times 1{,}0 - 50 \times 2{,}2 - R_2 \times 3{,}0 = 0$

$-120 + 80 - 110 = 3{,}0 R_2$

$-150 = 3{,}0 R_2 \Rightarrow R_2 = -50\,N \therefore$ $\boxed{R_2 = 50\,N \text{ p/ Baixo}}$

$R_1 = 150 - (-50) \Rightarrow \boxed{R_1 = 200\,N}$

(4)



$F_1x = 120 \cdot \cos 60° \Rightarrow F_1x = 60\,N$

$F_1y = 120 \cdot \operatorname{sen} 60° \Rightarrow F_1y = 104\,N$

$F_2x = -100 \cdot \cos 45° \Rightarrow F_2x = -70{,}7\,N$

$F_2y = 100 \cdot \operatorname{sen} 45° \Rightarrow F_2y = 70{,}7\,N$

$\Sigma F_V = 0 \Rightarrow \quad R_1 + R_2 = 104 + 70{,}7 + 80$

$R_1 + R_2 = 255\ N$

$\Sigma F_H = 0 \Rightarrow \quad R_2 = 71 - 60$

$\boxed{R_2 = 11\ N}$ (na horizontal)

$\Sigma M_t = 0 \Rightarrow \quad -104 \times 1{,}2 + 70{,}7 \times 0{,}6 - R_2 \times 1{,}8 + 80 \times 2{,}8 = 0$

$-125 + 42{,}4 + 224 = 1{,}8 R_2$

$R_2 = \dfrac{141{,}4}{1{,}8} \Rightarrow \boxed{R_2 = 79\ N}$ (na vertical)

$R_1 = 255 - 79$

$\boxed{R_1 = 176\ N}$