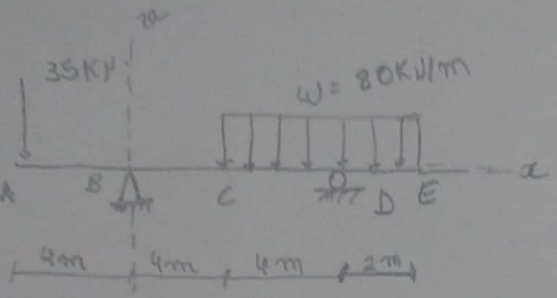
Aluna: Rayanne Dias Barros

Questão 1

$I_z = 351 \cdot 10^6 \, mm^4$

$E = 200 \, GPa = 200 \cdot 10^9 \, Pa$

$w = 80 \, KN/m$



(I) Reações de apoio:

$\Sigma F_y = 0 \therefore -35 + R_B - 480 + R_D = 0$

$\therefore \boxed{R_B + R_D = 515}$

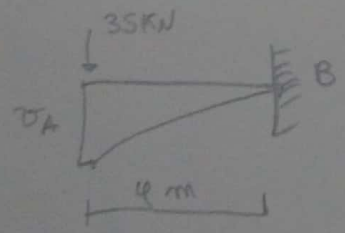
$\Sigma M_B = 0 \therefore 35 \cdot 4 - 480 \cdot 7 + R_D \cdot 8 = 0$

$\therefore \boxed{R_D = 402,5 \, KN}$

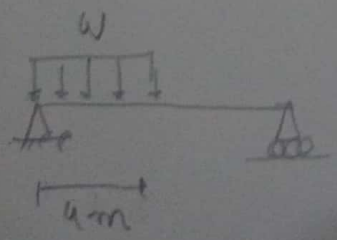
Assim,

$\boxed{R_B = 110,5 \, KN}$

(II) Pela tabela, tem-se:



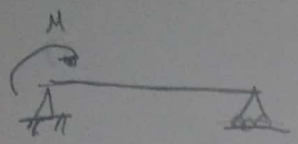
$v_A = \frac{-35 \cdot 4^3}{3 \cdot (7,02 \cdot 10^4)} = \boxed{-0,01063 \, m}$



$\theta_B = \frac{80 \cdot 4^2}{24 \cdot 8 \cdot (7,02 \cdot 10^4)} \cdot (2 \cdot 8^2 - 4^2) =$

$= \boxed{0,01064 \, rad}$

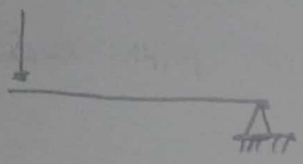
$\therefore v_a = 4 \, m \cdot 0,01064 \, rad = \boxed{0,04256 \, m}$



$$\theta_B = \frac{160 \cdot 8}{6 \cdot (1{,}02 \cdot 10^6)} = \boxed{0{,}00304 \text{ rad}}$$

$$\therefore v_a = -4\text{m} \cdot 0{,}00304 \text{ rad} = \boxed{-0{,}01216 \text{ m}}$$

$M = 160 \text{ KN/m}$



$$\theta_B = \frac{140 \cdot 8}{3 \cdot (1{,}07 \cdot 10^6)} = \boxed{0{,}00532 \text{ rad}}$$

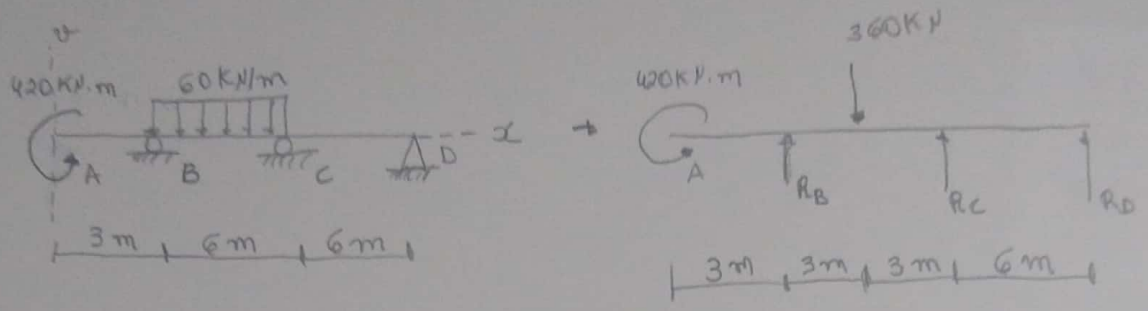
$$\therefore v_a = -4\text{m} \cdot 0{,}00532 \text{ rad} = \boxed{-0{,}02127 \text{ m}}$$

Pelo método da superposição:

$$v_a = -0{,}01063 - 0{,}01216 + 0{,}04256 - 0{,}02127 =$$

$$= -0{,}00152 \text{m} = \boxed{1{,}502 \text{ mm para baixo}}$$

Questão 2



① Reação de apoio:

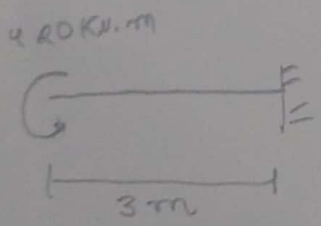
$\Sigma F_y = 0 \therefore \boxed{R_B + R_C + R_D = 360}$

$\Sigma M_B = 0 \therefore 420 - 360 \cdot 3 + R_C \cdot 6 + R_D \cdot 12 = 0$

$\therefore 6R_C + 12R_D = 1080 - 420$

$\therefore \boxed{6R_C + 12R_D = 660}$

② Pela tabela, tem-se:



$\theta = \frac{-420 \cdot 3^2}{2EI}$