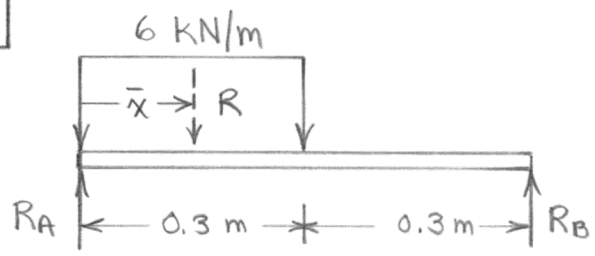
5/101

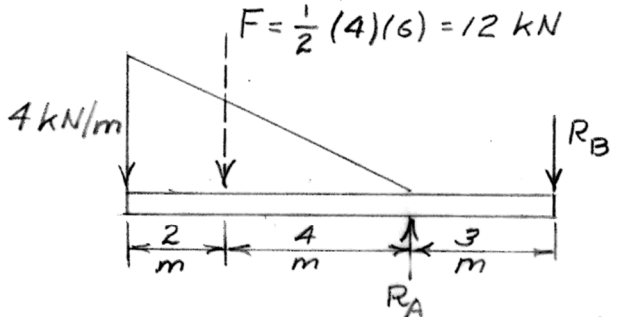


$R = 6(0.3) = 1.8 \text{ kN} \quad @ \quad \bar{x} = \frac{1}{2}(0.3) = 0.15 \text{ m}$

$\circlearrowleft + \Sigma M_A = 0: \quad R_B(0.6) - 1.8(0.15) = 0, \quad \underline{R_B = 0.45 \text{ kN}}$

$+\uparrow \Sigma F = 0: \quad 0.45 - 1.8 + R_A = 0, \quad \underline{R_A = 1.35 \text{ kN}}$

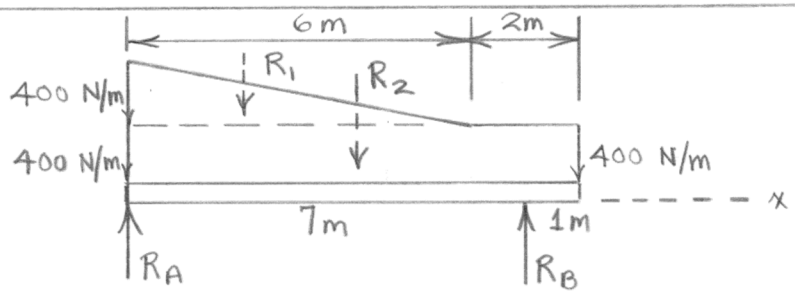
5/102



$\circlearrowleft + \Sigma M_A = 0: \quad 12(4) - 3R_B = 0, \qquad R_B = 16 \text{ kN}$

$+\uparrow \Sigma F = 0: \quad R_A - 16 - 12 = 0, \qquad R_A = 28 \text{ kN}$

5/103



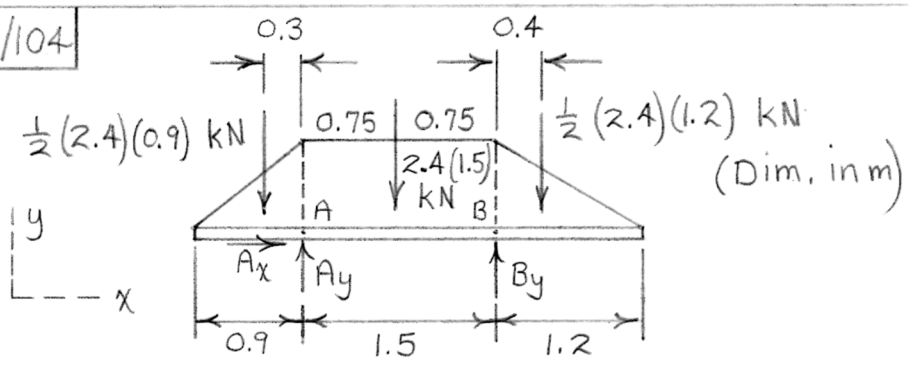
$R_1 = \frac{1}{2}(400)(6) = 1200$ N @ $\bar{x}_1 = \frac{1}{3}(6) = 2$ m

$R_2 = 400(8) = 3200$ N @ $\bar{x}_2 = \frac{1}{2}(8) = 4$ m

$\circlearrowleft + \Sigma M_A = 0$: $R_B(7) - 1200(2) - 3200(4) = 0$, $R_B = 2170$ N

$+\uparrow \Sigma F = 0$: $R_A - 1200 - 3200 + 2170 = 0$, $R_A = 2230$ N

5/104



$\circlearrowleft + \Sigma M_A = 0$: $1.08(0.3) - 3.6(0.75) - 1.44(1.9) + B_y(1.5) = 0$

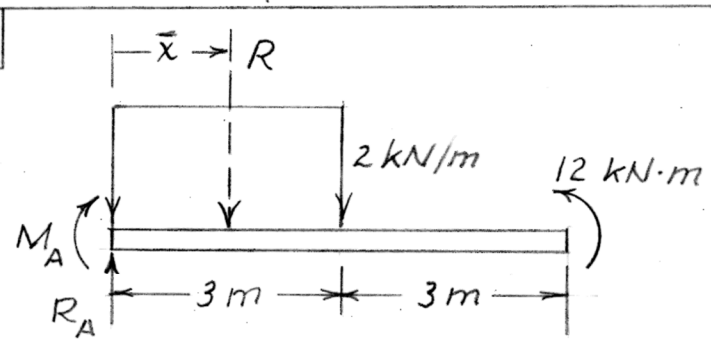
$B_y = 3.41$ kN

$\Sigma F_y = 0$: $A_y + 3.41 - 1.08 - 3.6 - 1.44 = 0$

$A_y = 2.71$ kN

$\Sigma F_x = 0$: $A_x = 0$

5/105

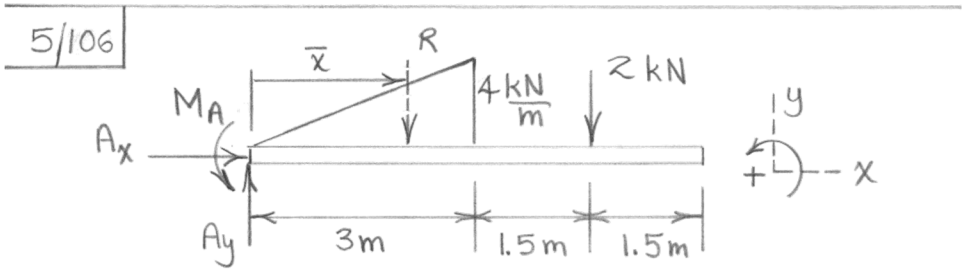


$R = 2(3) = 6\ \text{kN} \quad @ \quad \bar{x} = 1.5\ \text{m}$

$\circlearrowleft + \Sigma M_A = 0: \quad -M_A - 6(3/2) + 12 = 0, \quad M_A = 3\ \text{kN·m}$

$\uparrow + \Sigma F = 0: \quad R_A - 6 = 0, \quad R_A = 6\ \text{kN}$

5/106



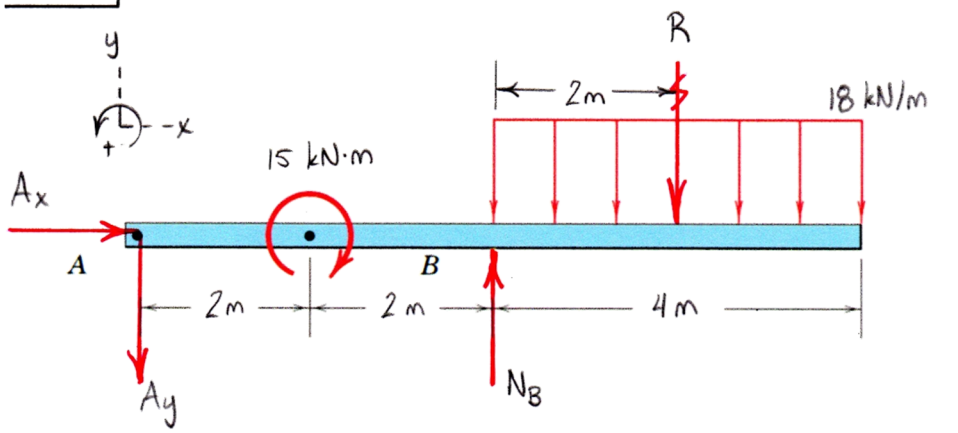
$R = \frac{1}{2}(3)(4) = 6$ kN @ $\bar{x} = \frac{2}{3}(3) = 2$m

$\Sigma M_A = 0$: $M_A - 6(2) - 2(4.5) = 0$, $M_A = 21$ kN·m

$\Sigma F_y = 0$: $A_y - 6 - 2 = 0$, $A_y = 8$ kN

$\Sigma F_x = 0$: $A_x = 0$

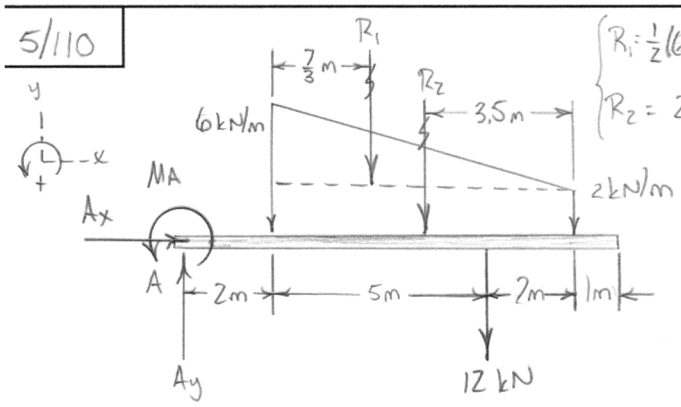
5/107



$R = 18(4) = 72$ kN

$$\begin{cases} \Sigma F_x = 0: & A_x = 0 \\ \Sigma F_y = 0: & -A_y + N_B - R = 0 \\ \Sigma M_A = 0: & 4N_B - 6R - 15 = 0 \end{cases} \longrightarrow \begin{cases} A_y = 39.8 \text{ kN} \downarrow \\ N_B = 111.8 \text{ kN} \uparrow \end{cases}$$

5/110



$R_1 = \frac{1}{2}(6-2)(7) = 14$ kN

$R_2 = 2(7) = 14$ kN

$\Sigma F_x = 0$: $A_x = 0$

$\Sigma F_y = 0$: $A_y - R_1 - R_2 - 12 = 0$

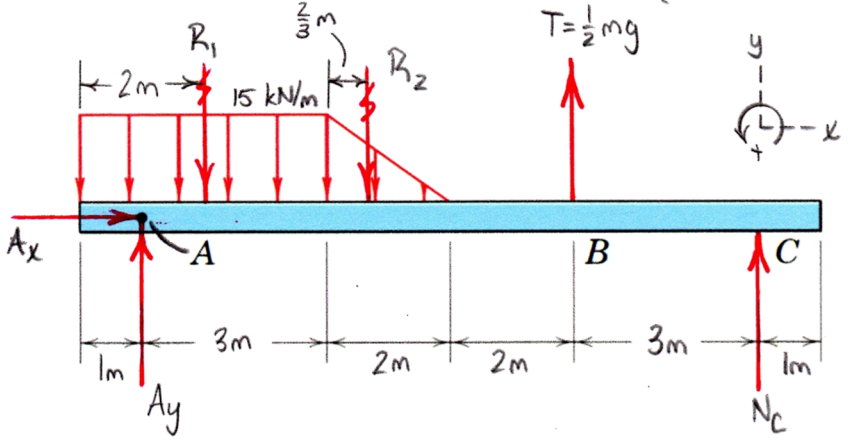
$\Sigma M_A = 0$: $M_A - (2+\frac{7}{3})R_1 - (2+3.5)R_2 - 7(12) = 0$

$A_y = 40$ kN ↑ $M_A = 222$ kN·m CCW

5/111 $m = 2$ Mg

$R_1 = 15(4) = 60$ kN

$R_2 = \frac{1}{2}(15)(2) = 15$ kN



$T = \frac{1}{2}(2000)(9.81) = 9810$ N

$\Sigma F_x = 0$: $A_x = 0$

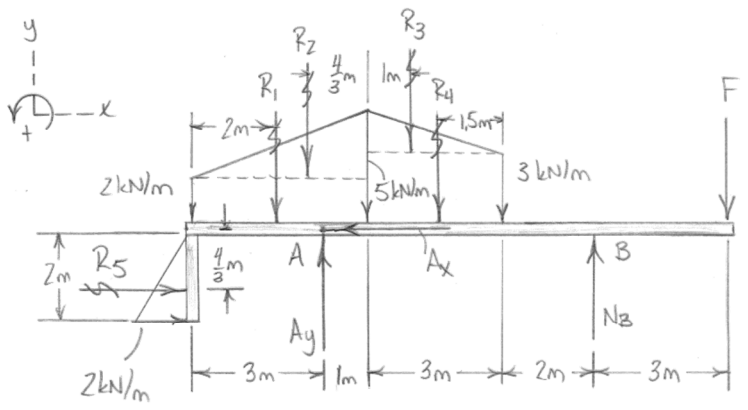
$\Sigma F_y = 0$: $A_y - R_1 - R_2 + T + N_c = 0$

$\Sigma M_A = 0$: $-1R_1 - (3 + \frac{2}{3})R_2 + 7T + 10N_c = 0$

$N_c = 4.63$ kN ↑

$A_y = 60.6$ kN ↑

5/116 FIND F FOR $A_y = N_B$



$$\begin{cases} R_1 = 2(4) = 8\ \text{kN} \\ R_2 = \frac{1}{2}(5-2)(4) = 6\ \text{kN} \\ R_3 = \frac{1}{2}(5-3)(3) = 3\ \text{kN} \end{cases} \qquad \begin{cases} R_4 = 3(3) = 9\ \text{kN} \\ R_5 = \frac{1}{2}(2)(2) = 2\ \text{kN} \end{cases}$$

$$\begin{cases} \Sigma F_x = 0: \ -A_x + R_5 = 0 \longrightarrow A_x = 2\ \text{kN} \\ \Sigma F_y = 0: \ A_y + N_B - F - R_1 - R_2 - R_3 - R_4 = 0 \\ \Sigma M_B = 0: \ -3F + 3.5R_4 + 4R_3 + (5+\tfrac{4}{3})R_2 + 7R_1 + \tfrac{4}{3}R_5 - 6A_y = 0 \end{cases}$$

$$A_y = N_B = 18.18\ \text{kN} \qquad \underline{F = 10.36\ \text{kN}}$$

$$R_A = \sqrt{A_x^2 + A_y^2} = \sqrt{18.18^2 + 2^2} \longrightarrow \underline{R_A = 18.29\ \text{kN}}$$