ROXANA GERALDINE HERNÁNDEZ GÁLVEZ

ARQ. PEDRO ALBERTO GARCIA LOPEZ

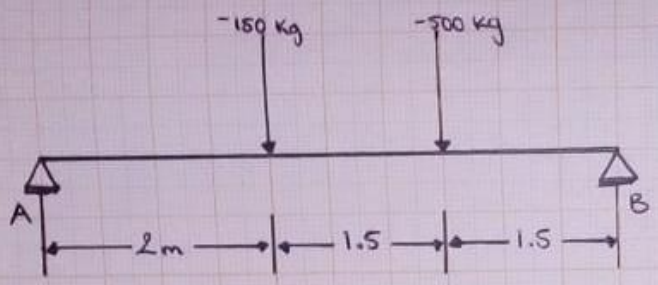
ESTATICA PARA LA ARQUITECTURA

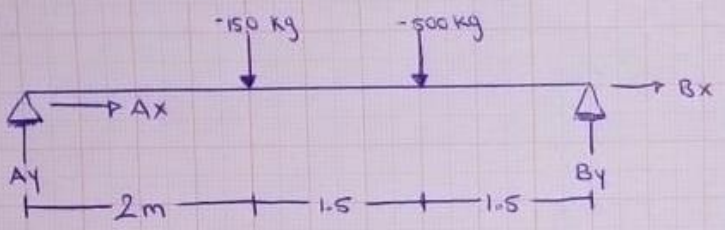
EQUILIBRIO DE UN CUERPO RIGIDO

3ER. CUATRIMESTRE

LAR- LICENCIATURA EN ARQUITECTURA “A”

COMITÁN DE DOMÍNGUEZ CHIAPAS A 08 JULIO 2021.





$\Sigma FX = 0 \longrightarrow Ax + Bx = 0$

$\Sigma MA = 0 \longrightarrow -(150\,Kg \cdot 2m) - (500\,Kg \cdot 3.5m) + By \cdot 5m$

$-300\,Kg\cdot m - 1750\,Kg\cdot m + By \cdot 5m$

$-2050\,Kg\cdot m + By \cdot 5m$

$By \cdot 5m = 2050\,Kg\cdot m$

$By = \frac{2050\,Kg\cdot m}{5m} = 410\,Kg$

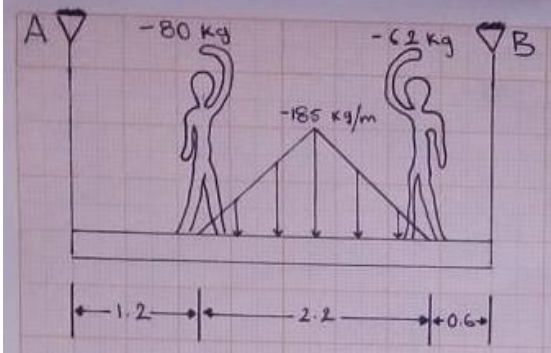
$\Sigma FY = 0 \longrightarrow +Ay - 150\,Kg - 500\,Kg + 410\,Kg = 0$

$+Ay - 240\,Kg = 0$

$Ay = 240\,Kg$

Comprobación

$240 - 150 - 500 + 410 = 0$

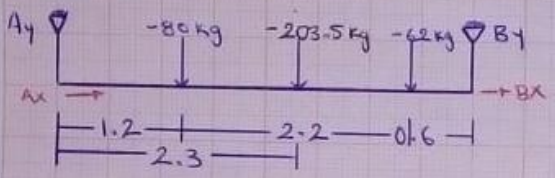


$PX = (w \cdot L/2)$

$= (-185\ kg/m \cdot 2.2m) = -203.5\ Kg$

$Up = L/2$

$= 2.2/2 = 1$



$\Sigma FX = 0 \rightarrow Ax + Bx = 0$

$\Sigma MA = 0 \rightarrow -80\ kg(1.2\ m) - 203.5\ kg(2.3m) - 62\ kg(5.4m) + By(4m)$

$-96\ kg \cdot m - 468.05\ kg \cdot m - 210.8\ kg \cdot m + By \cdot 4m = 0$

$-774.85\ kg \cdot m + By \cdot 4m = 0$

$By = \frac{774.85\ kg \cdot m}{4m} = 193.7125\ kg$

$\Sigma FY = 0 \rightarrow Ay - 80\ kg - 203.5\ kg - 62\ kg + 193.7125\ kg = 0$

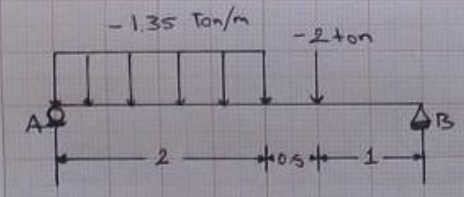
$Ay - 345.5\ kg + 193.7125\ kg = 0$

$Ay - 151.7875 = 0$

$Ay = 151.7875\ kg$

Comprobación

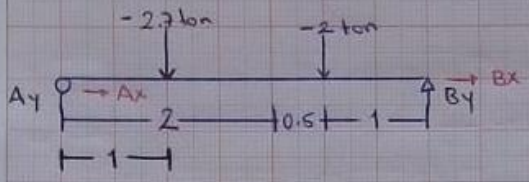
$151.7875\ kg - 80\ kg - 203.5\ kg - 62\ kg + 193.7125\ kg = 0$



$P = W \cdot L$

$P = (-1.3\ ton/m \cdot 2m) = -2.7\ ton$

$Up = L/2 = 2/2 = 1$



$\Sigma FX = 0 \rightarrow Ax + Bx = 0$

$\Sigma MA = 0 \rightarrow -(2.7\ ton \cdot 1m) - (2\ ton \cdot 2.5m) + (By \cdot 3.5\ m) = 0$

$-2.7\ ton \cdot m - 5\ ton \cdot m + By \cdot 3.5\ m = 0$

$-7.7\ ton \cdot m + By \cdot 3.5\ m = 0$

$By \cdot 3.5\ m = 7.7\ ton \cdot m$

$By = \frac{7.7\ ton \cdot m}{3.5\ m} = 2.2\ ton$

$\Sigma FY = 0 \rightarrow +Ay - 2.7\ ton - 2\ ton + 2.2\ ton = 0$

$+Ay - 4.7\ ton + 2.2\ ton = 0$

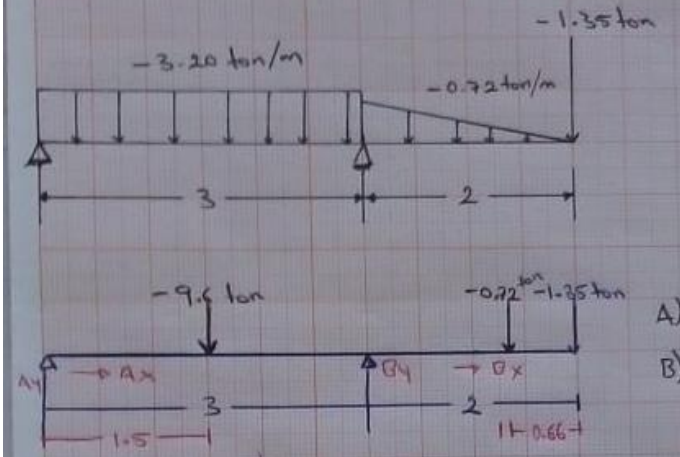
$Ay - 2.5\ ton = 0$

$Ay = 2.5\ ton$

Comprobación

$2.5\ ton - 2.7\ ton - 2\ ton + 2.2\ ton = 0$

Carga compuesta triangular - rectangular



$P = W \cdot L$

$P = (-3.20\ ton/m \cdot 3m) = 9.6\ ton$

$up = L/2 = 3/2 = 1.5\ m$

$P = (W \cdot L)/2$

$P = \frac{(-0.72\ ton/m \cdot 2m)}{2} = 0.72\ ton$

A) $up = 2/3 \times 2 = 1.33\ m$

B) $up = 1/3 \times 2 = 0.66\ m$

$\Sigma FX = 0 \rightarrow Ax + Bx = 0$

$\Sigma MA = 0 \rightarrow -(9.6\ ton \cdot 1.5\ m) + (By \cdot 3m) - (0.72\ ton \cdot 4.33\ m) - (1.35\ ton \cdot 0.66)$

$-14.4\ ton \cdot m + By \cdot 3m - 3.11\ ton \cdot m - 0.89\ ton \cdot m = 0$

$-18.4 + By \cdot 3m = 0$

$By \cdot 3m = 18.4\ ton \cdot m$

$By = \frac{18.4\ ton \cdot m}{3\ m} = 6.13\ ton$

$\Sigma FY = +Ay - 9.6\ ton + 6.13\ ton - 0.72\ ton - 1.35\ ton = 0$

$+Ay - 11.67 + 6.13 = 0$

$Ay - 5.54 = 0$

$Ay = 5.54\ ton$

Comprobación

$5.54\ ton - 9.6\ ton + 6.13\ ton - 0.72 - 1.35\ ton = 0$