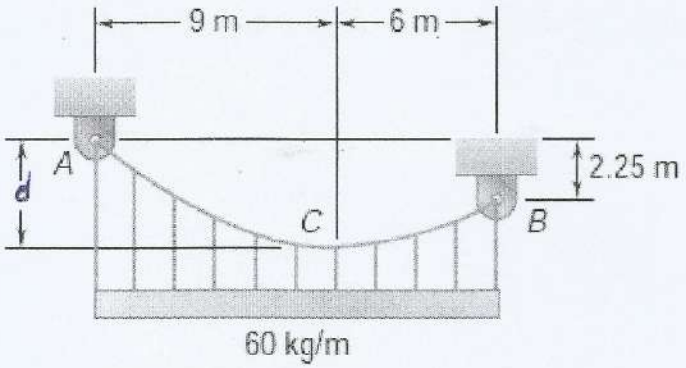
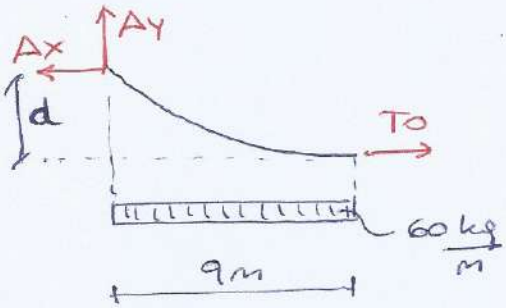
El cable ACB soporta una carga uniformemente distribuida a lo largo de la horizontal como se muestra. El punto más bajo C está ubicado 9 m a la derecha de A. Determine:

a) La distancia vertical **d**
b) La longitud del cable.
c) Los componentes de la reacción en A.



a)

TRAMO AC



$\Sigma F_y = 0 \quad A_y - 60\frac{kg}{m} \cdot 9m = 0$

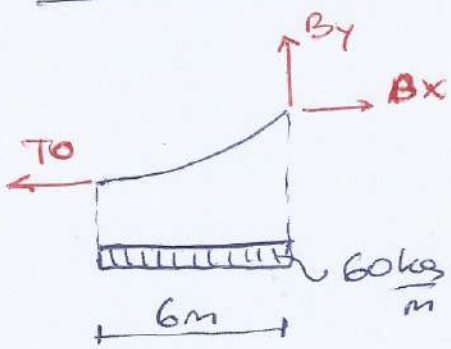
$\boxed{A_y = 540\ kg}$

$\Sigma F_x = 0 \quad T_o - A_x = 0$ ①

$\Rightarrow \boxed{A_x = T_o}$

$\Sigma M_A = 0 \quad -T_o \cdot d + 60\frac{kg}{m} \cdot 9m \cdot 4{,}5m = 0$ ②

TRAMO CB



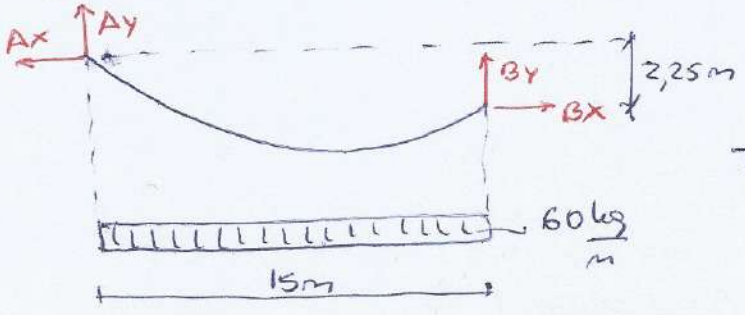
$\Sigma F_y = 0 \quad B_y - 60\frac{kg}{m} \cdot 6m = 0$

$\boxed{B_y = 360\ kg}$

$\Sigma F_x = 0 \quad -T_o + B_x = 0$

$\Rightarrow \boxed{B_x = T_o}$

TRAMO TOTAL



$\Sigma M_A = 0$

$15m \cdot 60\frac{kg}{m} \cdot 7{,}5m - 360\ kg \cdot 15m - T_o \cdot 2{,}25m = 0$

$T_o = \frac{15m \cdot 60\frac{kg}{m} \cdot 7{,}5m - 360\ kg \cdot 15m}{2{,}25m}$

$\boxed{T_o = 600\ kg}$

en (2)

$$-T_O \cdot d + 60\,\frac{kg}{m} \cdot 9m \cdot 4{,}5m = 0$$

$$d = \frac{60\,\frac{kg}{m} \cdot 9m \cdot 4{,}5m}{600kg} \qquad \boxed{d = 4{,}05m}$$

b) $T_O = \frac{w}{a} \longrightarrow a = \frac{w}{T_O} = \frac{60\,kg/m}{600kg} = 0{,}1\,\frac{1}{m}$

$$S_{izq} = \frac{1}{2}\left\{9m \cdot \sqrt{1+\left(0{,}1\,\frac{1}{m}\right)^2 \cdot (9m)^2} + \frac{1}{0{,}1\,\frac{1}{m}} \cdot \ln\left[0{,}1\,\frac{1}{m} \cdot 9m + \sqrt{1+\left(0{,}1\,\frac{1}{m}\right)^2 \cdot (9m)^2}\right]\right\}$$

$$S_{izq} = \frac{1}{2}\left(12{,}11m + 8{,}09m\right) \qquad S_{izq} = 10{,}1\,m$$

$$S_{der} = \frac{1}{2}\left\{6m \cdot \sqrt{1+\left(0{,}1\,\frac{1}{m}\right)^2 \cdot (6m)^2} + \frac{1}{0{,}1\,\frac{1}{m}} \cdot \ln\left[0{,}1\,\frac{1}{m} \cdot 6m + \sqrt{1+\left(0{,}1\,\frac{1}{m}\right)^2 \cdot (6m)^2}\right]\right\}$$

$$S_{der} = \frac{1}{2} \cdot \left(7{,}02m + 5{,}71m\right) = \qquad S_{der} = 6{,}37\,m$$

$$S = 10{,}1m + 6{,}37m \qquad \boxed{S = 16{,}47\,m}$$

c) $\boxed{A_y = 540\,kg}$

de (1) $\quad A_x = T_O \longrightarrow \boxed{A_x = 600\,kg}$