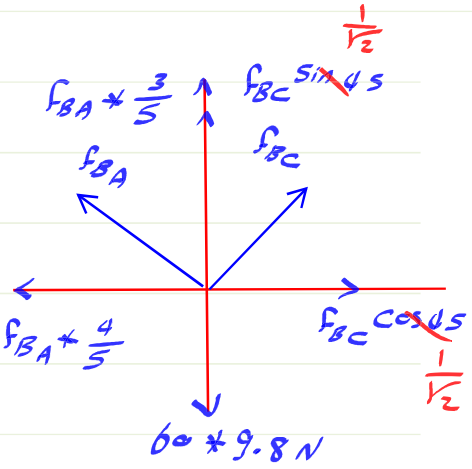
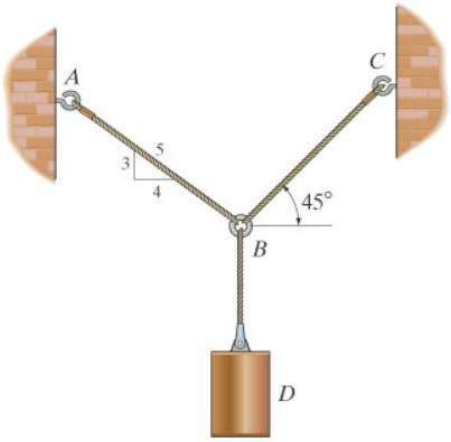
M R
Ahmed Mahdy
فيزياء
استاتيكا
دوائر كهربية
الكترونيات
ميكانيكا الانشائات
هيدروليكا
مدرس خصوصي
اونلاين
حضوري
يحصل الطالب علي
. مقاطع فيديوهات لشرح المقرر بشكل وافي
. ملخص للمادة Pdf للمذكرة والمراجعة
. محاضرات مباشرة علي برنامج زووم
لمناقشة الأجزاء الغير مفهومة
. تواصل مستمر مع معلم المادة
للتواصل
0567630097
0565657741

Determine the tension in cables BA and BC necessary to support the 60-kg cylinder.





$$\Sigma F_x = f_{BC} \cdot \frac{1}{\sqrt{2}} - f_{BA} * \frac{4}{5} = 0 \rightarrow (1)$$

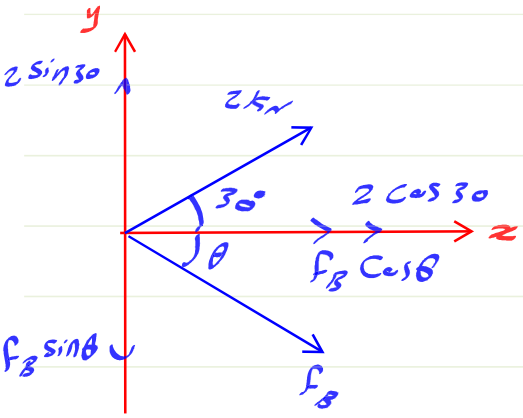
$$\Sigma F_y = f_{BC} \cdot \frac{1}{\sqrt{2}} + f_{BA} * \frac{3}{5} - 60 * 9.8 = 0$$

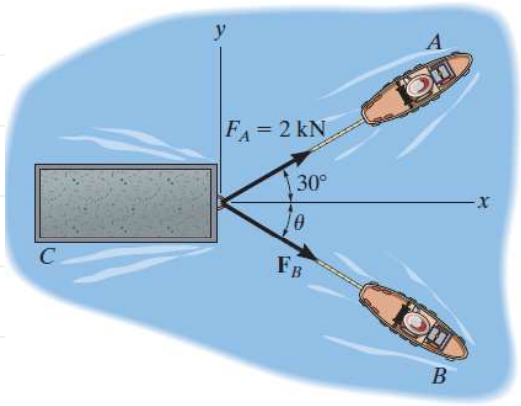
$$f_{BC} \cdot \frac{1}{\sqrt{2}} + f_{BA} * \frac{3}{5} = 60 * 9.8 \rightarrow (2)$$

$$f_{BC} = 425.18\ kN$$

$$f_{BA} = 420\ kN$$

If the resultant force of the two tugboats is 3 kN, directed along the x positive axis, determine the required magnitude of force FB and its direction θ.





$$\Sigma f_x = 2\cos 30 + f_B \cos\theta = 3$$

$$f_B \cos\theta = 3 - 2\cos 30 \rightarrow (1)$$

$$\Sigma f_y = 2\sin 30 - f_B \sin\theta = 0$$

$$f_B \sin\theta = 2\sin 30 \rightarrow (2)$$

dividing eq (2) by eq (1)

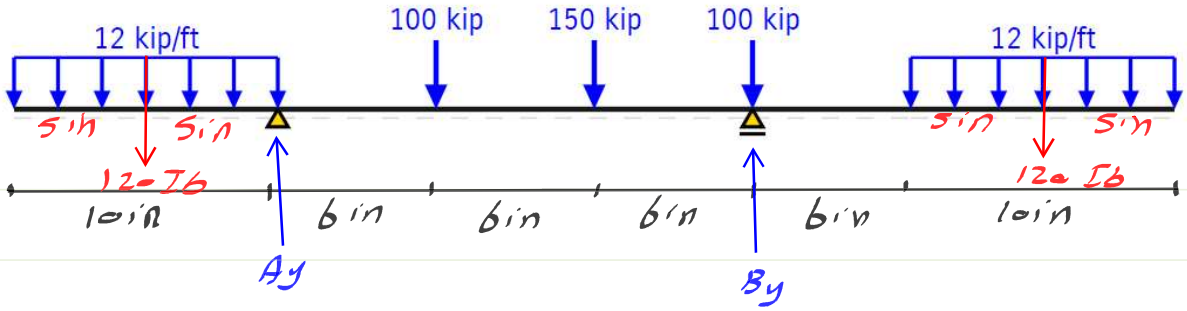
$$\frac{f_B \sin\theta}{f_B \cos\theta} = \frac{2\sin 30}{3 - 2\cos 30}$$

$$\tan\theta = 0.7887 \Rightarrow \theta = \tan^{-1}(0.7887) = 38.26$$

- from eq (2)

$$f_B = \frac{2\sin 30}{\sin 38.26} = 1.6155\,kN$$

Find the reactions Ay and By



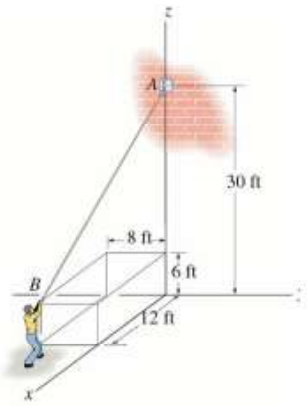
$$\Sigma M_A = 120 * 5 - 100 * 6 - 150 * 12 - 100 * 18 + By * 18 - 120 * 29 = 0$$

$$By = 393.33 \text{ kip} \uparrow$$

$$\Sigma Fy = -120 + Ay - 100 - 150 - 100 + \cancel{By}^{393.35} - 120 = 0$$

$$Ay = 196.67 \text{ kip} \uparrow$$

1. The man shown in the figure pulls on a cord with a force of 70 lb. Represent the force acting on support A as a Cartesian vector and determine its direction., find α, β, γ



$A(0, 0, 30)$

$B(12, -8, 0)$

$\vec{r}_{AB} = 12\,i - 8\,j - 30\,k$

$$\vec{F}_{AB} = F_{AB} * \frac{\vec{r}_{AB}}{|\vec{r}_{AB}|} = 70 * \frac{12\,i - 8\,j - 30\,k}{\sqrt{12^2 + 8^2 + 30^2}} = 70 * \frac{12\,i - 8\,j - 30\,k}{38}$$

$$\vec{F}_{AB} = 30\,i - 20\,j - 60\,k$$

$$\vec{u} = \sqrt{30^2 + 20^2 + 60^2} = 70$$

$$\alpha = \cos^{-1}\frac{30}{70} = 64.62^\circ$$

$$\beta = \cos^{-1}\frac{-20}{70} = 106.6^\circ$$

$$\gamma = \cos^{-1}\left(\frac{-60}{70}\right) = 149^\circ$$