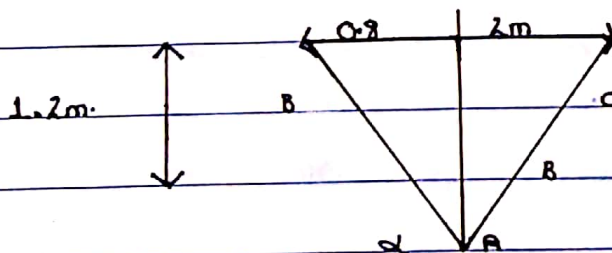


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ID	16079
Subject	ENGINEERING MECHANICS
Section	A
DEPARTMENT	BE (C)

QUESTION NO # 01Solution:

$$\alpha = \tan^{-1} \left(\frac{1.2}{0.8} \right)$$

$$= 56.3$$

important

(2)

$$B = \tan^{-1} \left(\frac{1.2}{2} \right)$$

$$B = 31.8$$

$$\text{Total mass} = 400 + 663.9 = 713.9 \text{ lb}$$

$$\text{OR } 3181.45 \text{ kg}$$

The total weight is being held by cable AB is 85.8%.

PART (a)

TENSION IN AB:

TENSION IN AB.

$$\vec{T}_{AB} = T_{AB} \hat{AB} = 0.858 (3181.45)(9.81) [\cos 56.3\hat{j} + \sin 56.3\hat{i}]$$

$$= 14857\hat{i} + 22278\hat{j} \text{ N}$$

Important

Important

PART (b)

INCREASE WEIGHT by 15%

$$400 + 60 = 460 \text{ lb}$$

INCREASING volume by 35%

$$3000 + 1050 = 4050 \text{ i OR } 8928.7 \text{ lb}$$

Total weight:

$$= 8928.7 + 460$$

$$\Rightarrow 9388.7 \text{ lb}$$

$$\text{OR } 4258.7 \text{ kg}$$

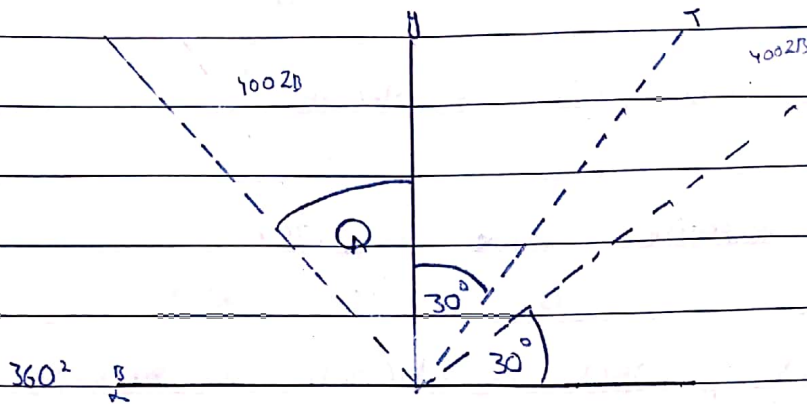
NOW FINDING TENSION IN AB

$$T_{AB} = T_{AB} \Delta AC = 0.555 (4258.7 (9.8)) \cdot (\cos 30^\circ \text{ i} + \sin 30^\circ \text{ j})$$

$$= 19874 \text{ i} + 11942 \text{ j N}$$

Important

∴ QUESTION # 02:



As we already know that force on x axis is

$$\sum F_x = 0$$

$$T \sin 30^\circ + 400 \sin 30^\circ - 240 \cos Q = 0$$

$$T \cos 30^\circ + 400 \cos 30^\circ - 300 - 240 \sin Q = 0 \rightarrow (1)$$

$$T \sin 30^\circ + 400 \cos 30^\circ - 300 - 240 \sin Q = 0 \rightarrow (2)$$

Solution of eq (1) & (2)

$$Q = 21.7^\circ, T = 2041.6$$

Important

QUESTION # 3:

Solution:

$$400 \text{ Lb/ft} \times 8 \text{ ft} = 3200 \text{ lb} \cdot 30 \text{ lb/ft} \times 4 \text{ ft} \\ = 1200 \text{ lb}$$

$$500 \text{ kg} = 1102.31 \text{ lb}$$

$$\Sigma M_A = 0$$

$$3200 - 1800(7.5) - 1200 \text{ lb} - 1102.31(3.67) \\ + B_y(12) = 0$$

$$B_y = 11952$$

$$\Sigma F_y = 0$$

$$A_y - 3200 - 1800 - 1200 - 1102.31 = 11950 \\ = 0$$

$$A_y = 11550.31$$

$$B_y = 11952 \cdot A_y = 11550.31$$

Best Quality Notes

important