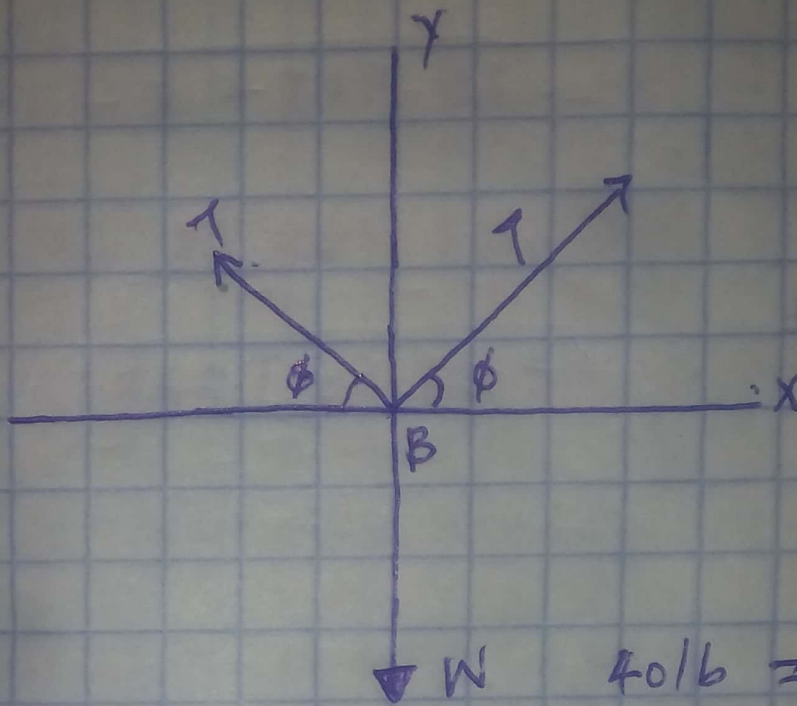


A.



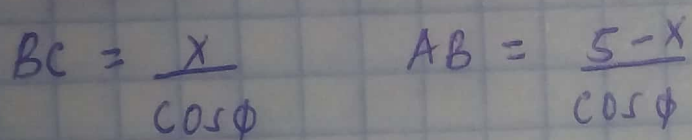
$$W = 40/6 = \frac{40}{0.2248} \text{ N}$$

$$\sum F_y = 0$$

$$T \sin \phi + T \sin \phi - W = 0$$

$$2T \sin \phi - \left(\frac{40}{0.2248} \right) = 0$$

$$2T \sin \phi - 177.93 = 0$$



$$\frac{x}{\cos \phi} + \frac{5-x}{\cos \phi} = 6$$

$$5 = 6 \cos \phi$$

$$\cos \phi = \frac{5}{6}$$

$$\phi = \cos^{-1} \left(\frac{5}{6} \right) = 33.56^\circ$$

Also,

$$BE = BD + DE$$

$$= x \tan \phi + 1$$

$$BE = (5 - x) \tan \phi$$

$$x \tan \phi + 1 = (5 - x) \tan \phi$$

$$x \tan 33.56^\circ + 1 = (5 - x) \tan 33.56^\circ$$

$$0.663x + 1 = 3.317 - 0.663x$$

$$1.326x = 2.317$$

$$x = 1.747 \text{ ft}$$

$$2T \sin \phi - 177.93 = 0$$

$$2T \sin 33.56^\circ - 177.93 = 0$$

$$1.10562T = 177.93$$

$$T = 160.93 \text{ N}$$

$$\text{Position } x = 1.747 \text{ ft}$$

$$\text{Tension in the cable} = 160.93 \text{ N}$$