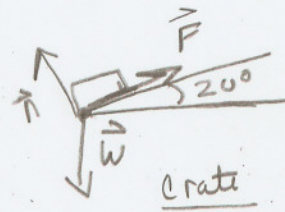
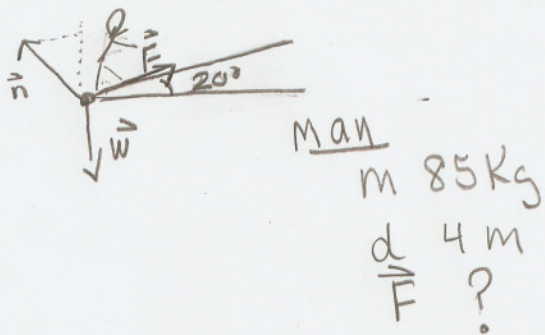


Calculate work done by:

85 Kg man who pushes a crate 4.00 up a ramp  
at angle  $20^\circ$   
to horizontal

He exerts a force of 500 N on the crate parallel  
to the ramp  
and moves at constant speed.

Include the work that he does on the crate  
and on his body to get up the ramp



$$F_{net} = ma$$

$$= 85 \text{ Kg} \cdot 0 \text{ m/s}^2$$

$$= 0$$

$$W = F d \cos \theta$$

$$= 500 \text{ N} \cdot 4 \text{ m} \cdot \cos(20^\circ)$$

work done on crate

$$\boxed{1879 \text{ J}}$$

$$x - \frac{0}{(\vec{W})} + \sin(20^\circ) \vec{n} + \cos(20^\circ) \vec{F} = 0$$

$$\vec{n} = -\frac{\cos(20^\circ)}{\sin(20^\circ)} \vec{F} = -2.75 \vec{F}$$

$$y - -85 \text{ Kg} (9.8 \text{ m/s}^2) + \cos(20^\circ) \vec{n} + \sin(20^\circ) \vec{F} = 0$$

$$-833 \text{ N} - \cos(20^\circ) \cdot 2.75 \vec{F} + \sin(20^\circ) \vec{F} = 0$$

$$-2.58 \vec{F} + .342 \vec{F} = 833 \text{ N}$$

$$F = -371 \text{ N}$$