

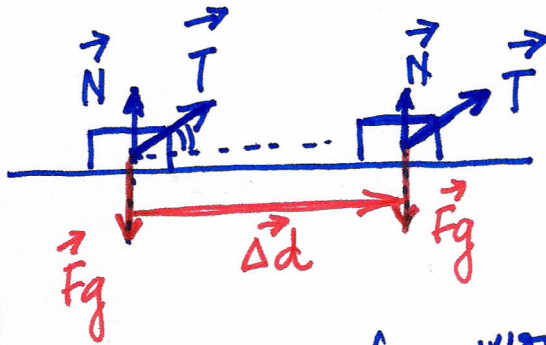
$$\alpha = 23^\circ$$

$$T = 47 \text{ N}$$

$$\Delta d = 5 \text{ m}$$

$$W = ?$$

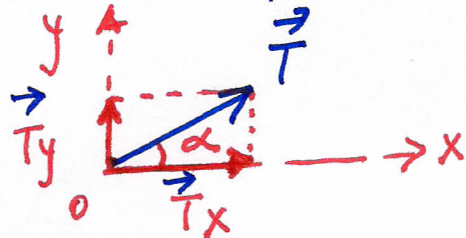
General



equation for work: $W = F \cdot \Delta d$

only when \vec{F} and $\Delta \vec{d}$ have the same direction

We will decompose \vec{T} into 2 different components



$$\cos \alpha = \frac{\text{adj}}{\text{hyp}} = \frac{T_x}{T}$$

\vec{T}_x and $\Delta \vec{d}$ have same direction

$$T_x = T \cdot \cos \alpha$$

$$W = T_x \cdot \Delta d = T \cdot \cos \alpha \cdot \Delta d$$

$$W = 47 \text{ N} \cdot \cos 23^\circ \cdot 5 \text{ m} = 216.2 \text{ J}$$

A sled is pulled with a rope at an angle of 23° above horizontal. The tension on the rope is 47 N. How much work is done to move the sled horizontally 5.0 m?