

Little Stevie does 144 J of work lifting an object up 3.3 m. What is the mass of the object?

$$W = 144 \text{ J}$$

$$d = 3.3 \text{ m}$$

$$m = ?$$

$$W = Fd = (mg)d$$

$$m = \frac{W}{gd} = \frac{144 \text{ J}}{9.8(3.3 \text{ m})} = \underline{\underline{4.5 \text{ kg}}}$$

Little Sammy picks up a 1.5 kg box from the ground and raises it up 1.2 m and then walks across the room 5.5 m and sets the box on a table .90 m off the ground. How much work did Sammy do?

$$M = 1.5 \text{ kg}$$

$$F_w \rightarrow 15 \text{ N}$$

$$d_{y1} = 1.2 \text{ m}$$

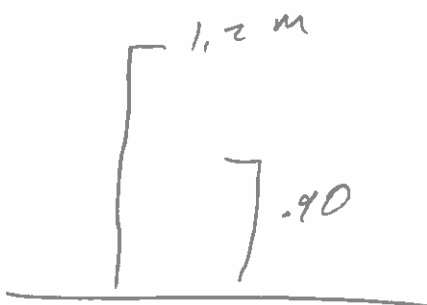
$$d_x = 5.5 \text{ m}$$

$$d_{y2} = .90 \text{ m}$$

$$W =$$

$$W = Fd_{\parallel}$$

$$W = 15 \text{ N} (.90 \text{ m}) = \underline{14 \text{ J}}$$

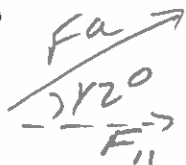


Little Suzie does 1350 J of work pulling a crate across a floor 22 m with a rope that makes an angle of 42° with the horizontal.

a) How much force does she exert on the

$w = 1350 \text{ J}$ rope?

$d_{||} = 22 \text{ m}$
 $\theta = 42^\circ$



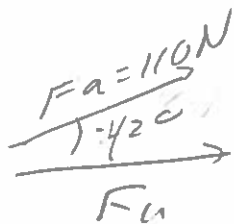
$$w = F d_{||} = w \cos \theta F d$$

$$F = \frac{w}{\cos \theta d} = \frac{1350 \text{ J}}{\cos 42^\circ (22 \text{ m})} = \underline{\underline{831}}$$

$$F_{11} = 62 \text{ N}$$

$F_a = ?$

b) How much work is done to overcome friction? $F_{act} = 110 \text{ N}$

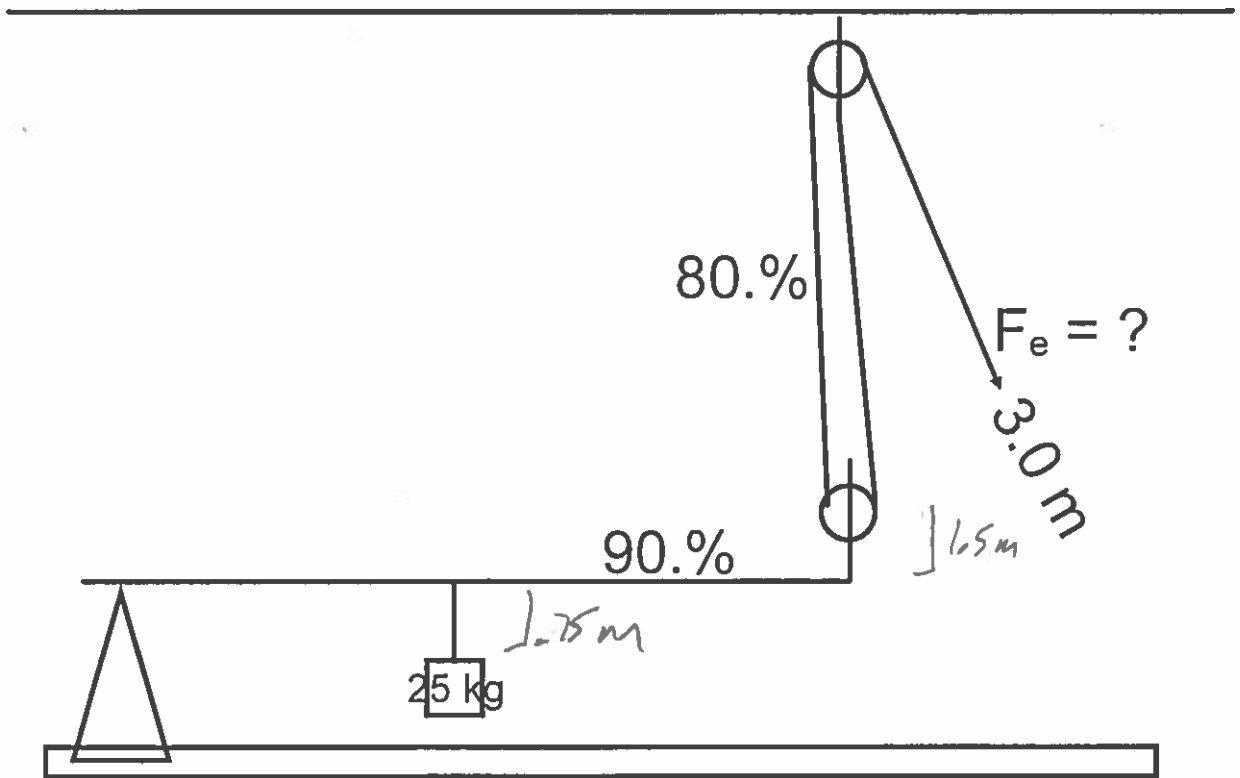


$$\cos 42^\circ = \frac{F_{11}}{110 \text{ N}}$$

$$F_{11} = 82 \text{ N}$$

$$\Sigma F = (62 \text{ N} - 82 \text{ N}) = -20 \text{ N}$$

$$w_f = F_{\Sigma} d_{||} = (-20 \text{ N}) 22 \text{ m} = \underline{\underline{440 \text{ J}}}$$



$$E_T = 0.9 \times 0.8 = 72\%$$

$$I_T = 2 \times 2 = 4$$

$$A_T = E I = 0.72(4) = 288$$

$$A_T = \frac{F_{r2}}{F_{e1}} \quad F_{e1} = \frac{F_{r2}}{A_T} = \frac{290N}{288} = \underline{\underline{84N}}$$