

① $m = 2.50 \times 10^3 \text{ kg}$
 $W = 5,000 \text{ J}$
 $d = 25.0 \text{ m}$
 $v_i = 0 \text{ m/s}$

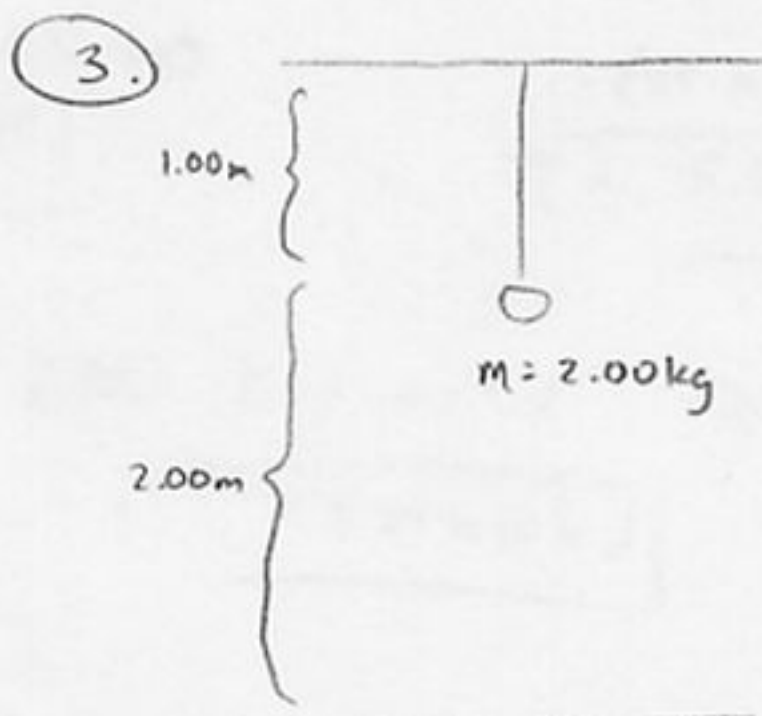
a) $W_{\text{net}} = \frac{1}{2}mv_f^2 - \frac{1}{2}mv_i^2$
 $v_f = \sqrt{\frac{2W_{\text{net}}}{m}}$
 $= \sqrt{\frac{2(5000)}{2500}}$
 $= 2.0 \text{ m/s}$

b) $W_{\text{net}} = Fd \cos \theta$

$5000 = F(25.0) \cos 0^\circ$
 $F = 2.0 \times 10^2 \text{ N}$

② $m = 25.0 \text{ kg}$
 $v = 12.5 \text{ m/s}$

$\frac{1}{2}mv^2 = mgh$
 $h = \frac{v^2}{2g}$
 $= \frac{(12.5)^2}{2(9.80)}$
 $= 7.97 \text{ m}$



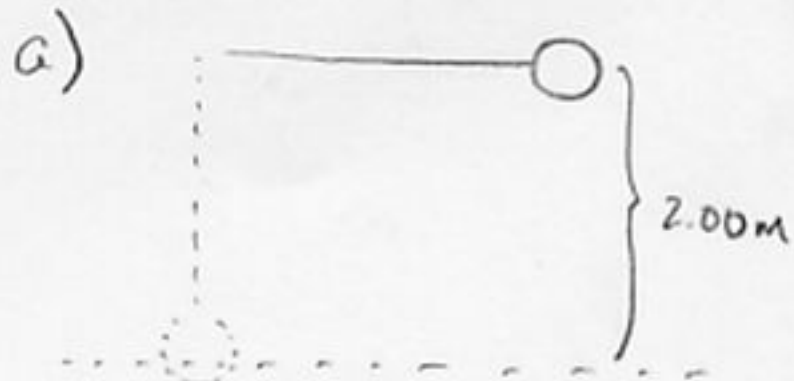
a) $PE = mgh$
 $= (2.00)(9.80)(-1.00)$
 $= -19.6 \text{ J}$

b) $PE = mgh$
 $= (2.00)(9.80)(2.00)$
 $= 39.2 \text{ J}$

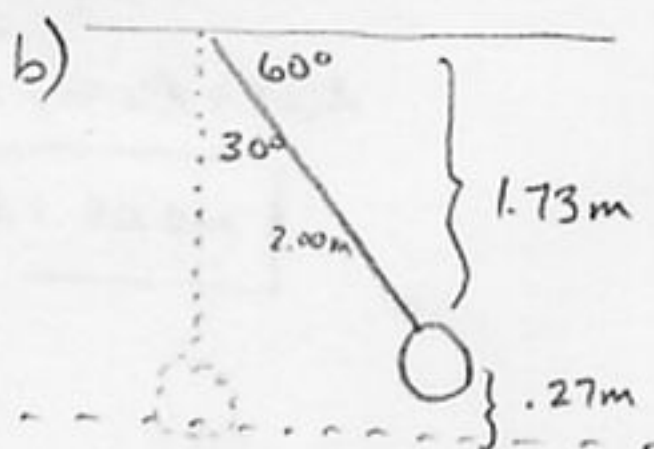
c) $PE = mgh$
 $= (2.00)(9.80)(0)$
 $= 0 \text{ J}$

④

$M = 40.0 \text{ kg}$



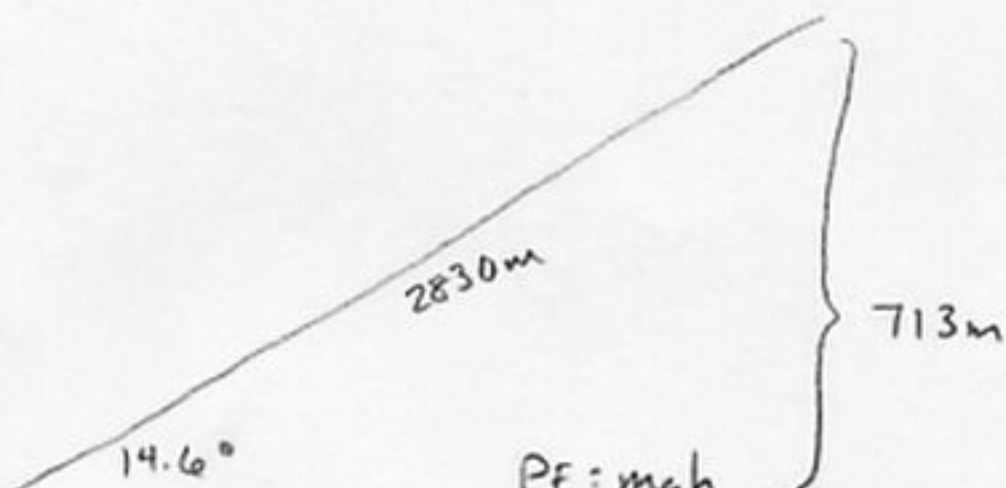
$PE = mgh$
 $= (40.0)(9.80)(2.00)$
 $= 784 \text{ J}$



$PE = mgh$
 $= (40.0)(9.80)(1.73)$
 $= 106 \text{ J}$

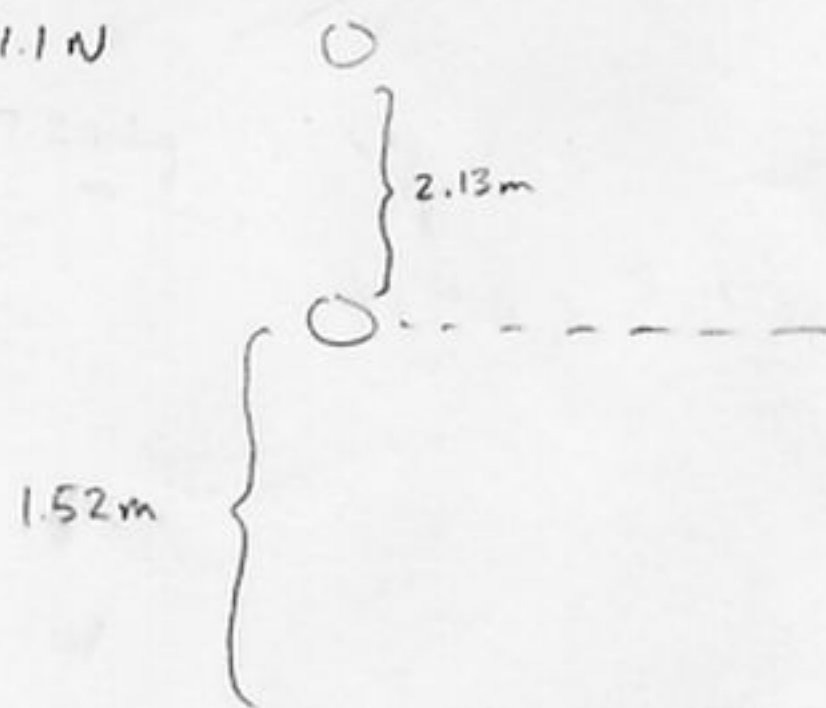
c) $PE = mgh$
 $= (40.0)(9.80)(0)$
 $= 0 \text{ J}$

⑤ $m = 75.0 \text{ kg}$



$PE = mgh$
 $= (75.0)(9.80)(7.13)$
 $= 5.24 \times 10^5 \text{ J}$

⑥ $F_g = 71.1 \text{ N}$



a) $W = Fd \cos \theta$
 $= (71.1)(2.13 - 1.52)(-1)$
 $= -43.4 \text{ J}$

b) $\Delta PE = PE_f - PE_i$
 $= mgh_f - mgh_i$
 $= 43.4 - 0$
 $= 43.4 \text{ J}$

p. 279 (70.)

a) $W = Fd \cos \theta$

$$= (400)(2.0)(\cos 0^\circ)$$

$$= 8.0 \times 10^2 \text{ J}$$

b) $m = 60.0 \text{ kg}$

$$F_g = (60.0)(9.80)$$

$$= 588 \text{ N}$$

$$W = Fd \cos \theta$$

$$= (588)(1.0)(1)$$

$$= 5.9 \times 10^2 \text{ J}$$

p. 292 (10)

$$m = 25.0 \text{ kg}$$

$$PE_{425\text{m}} = mgh$$

$$= (25.0)(9.80)(425)$$

$$= 1.04 \times 10^5 \text{ J}$$

$$PE_{225\text{m}} = mgh$$

$$= (25.0)(9.80)(225)$$

$$= 5.51 \times 10^4 \text{ J}$$

$$\Delta PE = 5.51 \times 10^4 \text{ J} - 1.04 \times 10^5 \text{ J}$$

$$= -4.89 \times 10^4 \text{ J}$$

p. 308 (66)

$$m = 10.0 \text{ kg}$$

$$KE = 1960 \text{ J}$$

$$KE = mgh$$

$$1960 = (10.0)(9.80)h$$

$$h = 20.0 \text{ m}$$