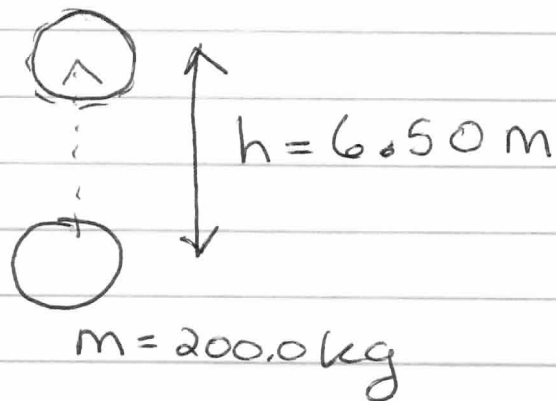


pg. 206 Problems 8.1

#12



$$\text{Work} = \text{Force} \times \text{distance} (\cos \theta)$$

Force to lift the ball must be comparable to the weight so find weight.

$$W = (\text{mass})(g) = (200.0 \text{ kg})(9.80 \text{ m/s}^2)$$

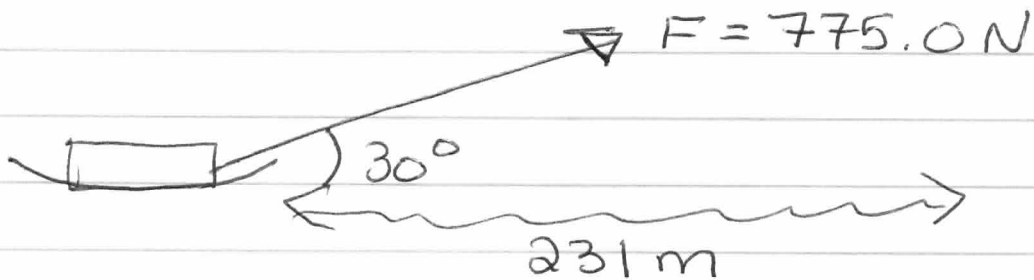
$$W = 1960 \text{ N}$$

$$\text{Work} = (1960 \text{ N})(6.50 \text{ m}) \cos(0^\circ)$$

$$\text{Work} = \underline{12740 \text{ J}}$$

Cont. Problems 8.1

#16



$$\begin{aligned} \text{Work} &= (\text{force})(\text{distance}) \cos \theta \\ &= (775.0 \text{ N})(231 \text{ m}) \cos 30^\circ \\ &= (179025)(.866025) \\ &= \underline{155040.2 \text{ J}} \end{aligned}$$

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Problems 8.3

#6

$$\begin{array}{l} \text{---} \\ \text{---} \text{---} \text{---} \\ \text{---} \end{array} \quad \begin{array}{l} m = 12.0 \text{ g} \\ v = 415 \text{ m/s} \end{array}$$

Find KE.

- Must convert mass to kg to keep units consistent

$$m = 0.012 \text{ kg}$$

$$\begin{aligned} E_k &= \frac{1}{2} m v^2 = \frac{1}{2} (0.012 \text{ kg}) (415 \text{ m/s})^2 \\ &= (.006) (172225) \\ &= 1033.35 \text{ J} \end{aligned}$$

#18

If KE is doubled velocity will increase as a factor of \sqrt{KE}

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Problems 8.4

#12



$$\text{○ } v = 95 \text{ ft/s} \approx 28.956 \text{ m/s}$$

Find height.

USE the fact that total energy will be the same across the path just transferred from one kind to another.

PE = MAX  KE = 0 J

PE = 0 J  KE = MAX

$$\begin{array}{ccc} \text{Bottom} & & \text{Top} \\ \cancel{KE} + \cancel{PE} & = & \cancel{KE} + PE \end{array}$$

$$\cancel{\frac{1}{2} m v^2} = mgh$$

$$h = \frac{\frac{1}{2} v^2}{g} = \frac{\frac{1}{2} (95 \text{ ft/s})^2}{32.2 \text{ ft/s}^2} = \frac{4512.5}{32.2} = 140.1 \text{ ft}$$