

$$(1) \text{ GPE} = mgh$$

$$h = 12 \text{ km}$$

$$g = 9.8$$

$$m = 7 \text{ kg}$$

$$\frac{12 \text{ km}}{1 \text{ m}} = \frac{1 \times 10^3 \text{ m}}{1 \text{ km}} = 12000$$

$$\text{GPE} = 7 \cdot 9.8 \cdot 12000 = 823200$$

$$\text{GPE} = 823200 \text{ J}$$

(2)

$$F = 30 \text{ N}$$

$$v_{\text{fin}} = 35 \text{ km/hr}$$

$$t = 40 \text{ s}$$

$$\frac{35 \text{ km}}{1 \text{ hr}} = \frac{1 \text{ hr}}{3600 \text{ s}} = \frac{1 \times 10^3 \text{ m}}{1 \text{ km}} = \frac{35000}{3600}$$

$$\frac{35000}{3600} = 9.72 \text{ m/s}$$

$$a = \frac{\Delta v}{t}$$

$$a = \left(\frac{9.72 - 0}{40} \right) \quad a = \frac{9.72}{40}$$

$$a = 0.108 \text{ m/s}^2$$

$$\frac{30}{.108} = m \frac{(.108)}{.108} \quad m = 277.7 \text{ kg}$$

$$p = m \cdot v$$

$$p = 277.78 \times 9.72 \quad p = 2700.0216 \frac{\text{kg} \cdot \text{m}}{\text{s}}$$

$$(3) \text{ KE} = \frac{1}{2} m v^2 \quad v = \frac{3000 \text{ m}}{3600 \text{ s}} = .83 \quad v = .83$$

mass - 1587 kg
distance - 3000 m
time - 3600 s

$$.83^2 = .6889$$

$$\text{KE} = \frac{1}{2} \times 1587 \times .6889$$

$$\text{KE} = 546.64215 \text{ J}$$

$$(4) \text{ Work} = \text{force} \cdot \text{distance}$$

$$W = 44 \text{ N} \cdot d \quad 60 \cancel{\text{ cm}} \cdot \frac{1 \times 10^{-2} \text{ m}}{1 \cancel{\text{ cm}}} = 60 \times 10^{-2} \text{ m} = 0.6 \text{ m}$$

$$W = 44 \cdot 0.6$$

$$W = 26.4 \text{ J}$$

$$\text{Power} = \frac{\text{Work (J)}}{\text{time (s)}}$$

$$P = \frac{26.4 \text{ J}}{6 \text{ s}}$$

$$P = 4.4 \text{ W}$$

$$(5) \text{ GPE} = mgh$$

$$30g \cdot \frac{1 \times 10^{-3} \text{ kg}}{1g} = \frac{30 \times 10^{-3} \text{ kg}}{0.03 \text{ kg}}$$

$$\text{GPE} = 0.03 \cdot 9.8 \cdot 1.7$$

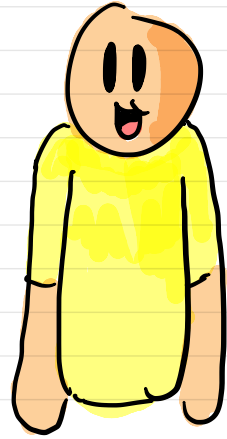
$$\text{GPE} = 0.4998 \text{ N}$$

$$(6) \frac{(70 \text{ N})(7 \text{ cm})}{15 \text{ cm}} = \frac{(F)(15 \text{ cm})}{15 \text{ cm}}$$
$$32.67 \text{ N} = F$$

$$\text{MA} = \frac{F_{\text{out}}}{F_{\text{in}}}$$

$$\text{MA} = \frac{70 \text{ N}}{32.67 \text{ N}}$$

$$\text{MA} = 2.14$$



- MS



- UW