

SET 1

①

$$m = 0.14 \text{ kg}$$

$$KE = \frac{1}{2} m \cdot v^2$$

a)  $v = 18 \text{ m/s}$

b)  $v = 0 \text{ m/s}$

a)  $KE = \frac{1}{2} \cdot 0.14 \text{ kg} \cdot (18 \text{ m/s})^2$

$$KE = ?$$

$$KE = 22.68 \text{ J} \approx 23 \text{ J}$$

b)  $KE = 0 \text{ J}$

②

$$v = 970 \text{ m/s}$$

$$KE = \frac{1}{2} m \cdot v^2$$

$$KE = 3.9 \times 10^3 \text{ J}$$

$$m = \frac{2KE}{v^2}$$

$$m = ?$$

$$m = \frac{2 \cdot 3.9 \times 10^3 \text{ J}}{(970 \text{ m/s})^2} = 0.00828 \text{ kg}$$

$$m = \frac{2 \cdot 3.9 \times 10^3 \text{ J}}{(970 \text{ m/s})^2}$$

$$m = 8.3 \times 10^{-3} \text{ kg}$$



SET 1

3

$$m = 1500 \text{ kg}$$

$$v = 120 \text{ km/h}$$

$$KE = ?$$

$$KE = \frac{1}{2} m \cdot v^2$$

$$v = 120 \text{ km/h} = \frac{120000 \text{ m}}{3600 \text{ s}}$$

$$v = 33.3 \text{ m/s}$$

$$KE = \frac{1}{2} \cdot 1500 \text{ kg} \cdot (33.3 \text{ m/s})^2$$

$$KE = 8.3 \times 10^5 \text{ J}$$



SET 2

①  $m = 78 \text{ Kg}$   
 $h = 46 \text{ m}$

a)  $PE = ?$

b)  $W = ?$

a)  $PE = m \cdot g \cdot h$

$PE = 78 \text{ Kg} \cdot 1.8 \text{ m/s}^2 \cdot 46 \text{ m}$

$PE = 35162.4 \text{ J} \approx \boxed{35000 \text{ J}}$

b)  $W = PE \approx \boxed{35000 \text{ J}}$

②  $F_g = 2400 \text{ N}$

$h = d = 5.2 \text{ m}$

$PE = ?$

$PE = m \cdot g \cdot h = F_g \cdot h$

$PE = 2400 \text{ N} \cdot 5.2 \text{ m}$

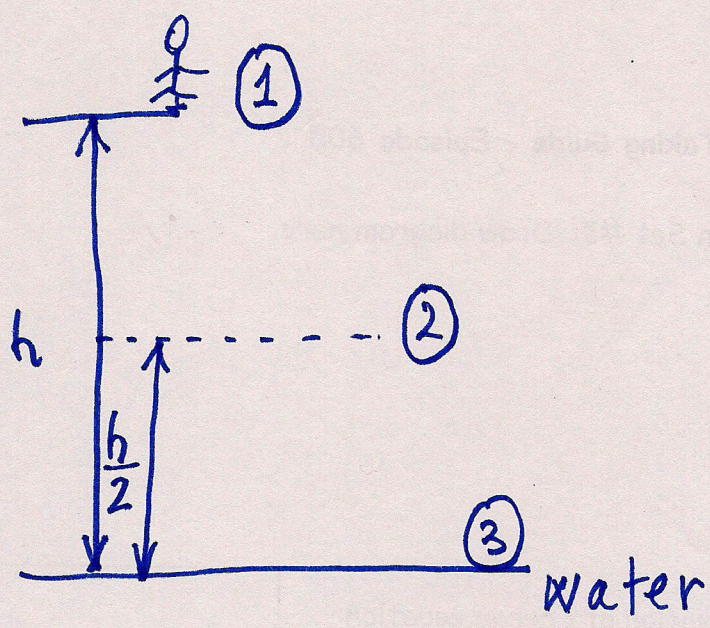
$PE = 12480 \text{ J} \approx \boxed{12000 \text{ J}}$



SET 4

$PE = 5800 \text{ J}$

- ①. a)  $PE_1 = ?$   
 $KE_1 = ?$
- b)  $PE_2 = ?$   
 $KE_2 = ?$
- c)  $PE_3 = ?$   
 $KE_3 = ?$



a)  $PE_1 = PE = \underline{5800 \text{ J}} = m \cdot g \cdot h$   
 $KE_1 = \underline{0 \text{ J}}$

b)  $PE_2 = m \cdot g \cdot \frac{h}{2} = \frac{1}{2} \cdot PE_1 = \frac{5800 \text{ J}}{2} = \underline{2900 \text{ J}}$

$PE_1 + KE_1 = PE_2 + KE_2$

$KE_2 = PE_1 + KE_1 - PE_2 = 5800 \text{ J} + 0 \text{ J} - 2900 \text{ J}$

$KE_2 = \underline{2900 \text{ J}}$

c)  $PE_3 = \underline{0 \text{ J}}$

$KE_3 = \underline{5800 \text{ J}}$



② [SET 4]

$$PE = 5800 \text{ J}$$

$$m = 62 \text{ Kg}$$

$$a) PE = m \cdot g \cdot h$$

$$h = \frac{PE}{m \cdot g}$$

$$h = \frac{5800 \text{ J}}{62 \text{ Kg} \cdot 9.8 \text{ m/s}^2}$$

$$a) h = ?$$

$$b) v = ?$$

$$h = 9.54 \text{ m} \approx 9.5 \text{ m}$$

$$h = 9.5 \text{ m}$$

$$b) KE = \frac{1}{2} m \cdot v^2$$

$$v = \sqrt{\frac{2KE}{m}}$$

$$v = \sqrt{\frac{2 \cdot 5800 \text{ J}}{62 \text{ Kg}}} = 13.68 \text{ m/s} \approx 14 \text{ m/s}$$