

Exercicis energia i treball - Donner

1)

a) $m = 15 \text{ kg} \rightarrow P = m \cdot g = 15 \cdot 9,8 = 147 \text{ N}$

$W = F_x \cdot \Delta x \cdot \cos \alpha = 147 \cdot 0 \cdot \cos 0^\circ = \underline{0 \text{ J}}$

b) $W = F_x \cdot \Delta x \cdot \cos \alpha = \underline{0 \text{ J}} \quad v = K$

c) $W = F_x \cdot \Delta x \cdot \cos \alpha = 147 \cdot 1 \cdot \underbrace{\cos 180^\circ}_{(-1)} = \underline{-147 \text{ J}}$

2)

a) $W = 20 \cdot 10 \cdot \cos 0^\circ = \underline{200 \text{ J}}$

b) $W = 20 \cdot 10 \cdot \cos 180^\circ = \underline{-200 \text{ J}}$

c) $W = 20 \cdot 10 \cdot \cos 90^\circ = \underline{0 \text{ J}}$

3)

a) $m = 100 \text{ kg}$
 $F_f = 250 \text{ N}$
 $F = 300 \text{ N}$

$F - F_r = m \cdot a$

$300 - 250 = 100 a$

$a = \frac{50}{100} = \underline{0,5 \text{ m/s}^2}$

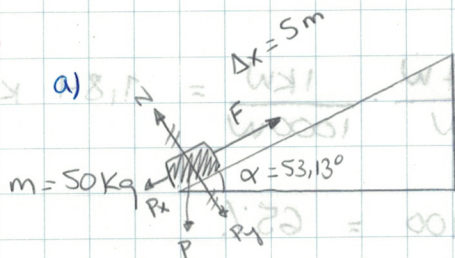
b) $t = 10 \text{ s}$

$\Delta x = v_0 \Delta t + \frac{1}{2} a \Delta t^2$

$\Delta x = 0,25 \cdot (10)^2 = 25 \text{ m}$

$W = F_x \cdot \Delta x \cdot \cos \alpha = \frac{300 - 250}{50} \cdot 25 \cdot \cos 0^\circ = \underline{1250 \text{ J}}$

4)



a) $F - P_x = m \cdot a = 0 \rightarrow v = K$

$F = P_x = m \cdot g \cdot \sin \alpha$

$F = 50 \cdot 9,8 \cdot \sin 53,13^\circ = \underline{392 \text{ N}}$

b) $W = F_x \cdot \Delta x \cdot \cos \alpha = 392 \cdot 5 \cdot \cos 0^\circ = \underline{1960 \text{ J}}$

c) $F - (P_x + F_r) = m \cdot a = 0 \rightarrow v = K$

$F_r = \mu m g \cos \alpha$

$F = 392 + 0,1 \cdot 50 \cdot 9,8 \cdot \cos 53,13^\circ$

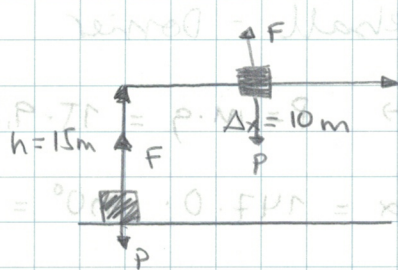
$F = 392 + 29,4 = \underline{421,4 \text{ N}}$

(5)

$$m = 100 \text{ kg}$$

$$h = 15 \text{ m}$$

$$\Delta x = 10 \text{ m}$$



a)

$$F = P = m \cdot g = 100 \cdot 9.8 = 980 \text{ N}$$

$$W = F_x \cdot \Delta x \cdot \cos \alpha = 980 \cdot 15 \cdot \cos 0^\circ = \underline{14700 \text{ J}}$$

b)

$$W = F_x \cdot \Delta x \cdot \cos \alpha = 980 \cdot 10 \cdot \cos 90^\circ = \underline{0 \text{ J}}$$

$$W_{\text{TOT}} = 14700 + 0 = \underline{14700 \text{ J}}$$

c)

$$P = \frac{\Delta W}{\Delta t} = \frac{14700 \text{ J}}{60 \text{ s}} = \underline{245 \text{ W}}$$