data fecha 17·05·21

D S T Q Q S S
D L M M J V S

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FÍSICA - 2021.1 - SIST. DE INFORMAÇÃO
LISTA EXERCÍCIOS - CAP. 8 - TRABALHO/ENERGIA PT. 2

4- $m = 825\,kg$ $v_0 = 17\,m/s$ $h = 42\,m$

a) $\Delta U = -W$

$W = -\Delta U$

$W = -(m \cdot g \cdot \cancel{h_1}^{\,0} - m \cdot g \cdot h_2)$

$W = 0\,J$

b) $\Delta U = -W$

$W = -(m \cdot g \cdot h/2 - mgh)$

$W = mgh - m \cdot g \cdot h/2$

$W = \frac{m g h}{2} = \frac{825 \cdot 9{,}8 \cdot 42}{2} = 169.785\,J$

c) $\Delta U = -W$

$W = -(\cancel{m \cdot g \cdot h_c}^{\,0} - m \cdot g \cdot h)$

$W = m \cdot g \cdot h = 825 \cdot 9{,}8 \cdot 42 = \boxed{339570\,J}$

d) $U(x) = m \cdot g \cdot x = 9{,}8 \cdot 825 \cdot 21 = \boxed{169.785\,J}$

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e) $U(x) = m \cdot g \cdot x = 825 \cdot 9{,}8 \cdot 42 = \boxed{339570\ J}$

$\Delta U_{AB} = U_f - U_i = 2mgh - 2mgh/2 =$

$2\left(mg\frac{h}{2}\right) = mgh$ (Aumenta)

13 -

a) $E_{mec_0} = E_{mec_A}$

$U_0 + K_0 = U_A + K_A$

$m \cdot g \cdot h + K_0 = m \cdot g \cdot h + K_0$

$K_0 = K_0 \Rightarrow V_A = V_0 = \boxed{10\ m/s}$

b) $U_0 + K_0 = U_B + K_B$

$K_B = m \cdot g \cdot \frac{h}{2} + \frac{1}{2} m \cdot V_0^2$

$\frac{1}{2} m \cdot V_B^2 = m \cdot g \cdot \frac{h}{2} + \frac{1}{2} m \cdot V_0^2$

$V_B^2 = g \cdot h + V_0^2$

$V_B^2 = 9{,}8 \cdot 42 + 10^2$

$V_B \approx \boxed{26{,}47\ m/s}$

c) $U_0 + K_0 = \cancel{U_c}^{0} + K_c$

$K_c = m \cdot g \cdot h + \frac{1}{2} m \cdot v_0^2$

$\frac{1}{2} v_c^2 = m \cdot g \cdot h + \frac{1}{2} v_0^2$

$v_c^2 = 2 \cdot 9{,}8 \cdot 42 + \frac{17^2}{2}$

$v_c^2 = 823{,}2 + 144{,}5 = 967{,}7$

$v_c \approx 31{,}10 \text{ m/s}$

d) $U_0 + K_0 = U_x + \cancel{K_x}^{0}$

$\cancel{m} \cdot g \cdot h + \frac{1}{2} \cancel{m} \cdot v_0^2 = \cancel{m} \cdot g \cdot h_x$

$g h_x - g h = \frac{(17)^2}{2} = 144{,}5$

$g h_x = 144{,}5 + 411{,}6$

$h_x \approx 56{,}74 \text{ m}$

e) As mesmas pois conforme ambas as resoluções efetuadas aqui os resultados independem do valor da massa.

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27 - $m = 8\,kg$ $\Delta x = 10\,cm = 0,1\,m$

a) $K = \frac{F}{x} = \frac{m \cdot g}{x} = \frac{8 \cdot 9,8}{0,1} = \boxed{784\ N/m}$

b) $U = \frac{1}{2} K x^2 = \frac{1}{2} \cdot 784 \cdot (0,4)^2 = \boxed{62,72\,J}$

c) $Emec_0 = Emec_f$

$\cancel{U_{h_0}}^{0} + U_{k_0} = U_{h_f} + \cancel{U_{k_f}}^{0}$

$\frac{1}{2} K x^2 = m \cdot g \cdot h$

$\boxed{62,72\,J} = U_{h_f}$

d) $U_{h_f} = 62,72$

$m \cdot g \cdot h = 62,72$

$h = \frac{62,72}{8 \cdot 9,8} = \boxed{0,8\,m = 80\,cm}$

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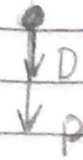
61- $P = 5,24\,N$ $\quad V_0 = 20\,m/s$ $\quad D = 0,265\,N$

a)



$$P + D = m \cdot a$$

$$5,24 + 0,265 = m \cdot a$$

$$a = \frac{5,555}{m} = \frac{5,555 \cdot 9,8}{5,24}$$

$$a = 10,24$$

$$V^2 = V_0^2 + 2a \cdot \Delta S \qquad (V^2 = 0)$$

$$V_0^2 = 2 \cdot (10,24) \cdot \Delta S$$

$$\frac{200}{20,24} = \Delta S \approx \boxed{19,44\,m}$$

b)

$$P - D = m \cdot a$$

$$5,025 = m \cdot a$$

$$a = \frac{5,025}{m}$$

$$V^2 = V_0^2 + 2a \cdot \Delta S \qquad (V_0^2 = 0)$$

$$V^2 = 19,44 \cdot \frac{5,025 \cdot 9,8 \cdot 2}{5,24}$$

$$V \approx \boxed{14,02\,m/s}$$