

Probleuario

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Nombre del tema:
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Nombre de la Materia: física II

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Problemas

Física II

1) $F = 30 \text{ N}$ $d = 60 \text{ cm}$ a) Trabajo
b) T. mecánico $\theta = 300^\circ$

a) $T = F \cdot d$
 $T = (30)(0.6)$
 $T = 18 \text{ J}$

b) $F = T \cos \theta$
 $F = 18 \cos 300$
 $F = 9$

$T = F \cdot d$
 $T = (9)(0.6)$
 $T = 5.4$

2) $m = 25 \text{ kg}$ $d = 6.7 \text{ m}$ Encontrar: Trabajo

$F = P = m \cdot g$
 $F = P = (25)(6.7)$
 $F = 167.5 \text{ N}$

$T = F \cdot d$
 $T = (167.5)(6.7)$
 $T = 1122.25 \text{ J}$

3) $F = 3 \text{ N}$ $d = 12,000 \text{ cm}$ Encontrar: Trabajo

$T = F \cdot d$
 $T = (3)(12)$
 $T = 36 \text{ J}$

4) $m = 6000 \text{ kg}$ $d = 150 \text{ m}$ $\theta = 200$ $M = 0.65$ a) Tension
b) Trabajo

$F = P = m \cdot g$
 $F = P = (6000)(9.81)$
 $F = P = 58,860 \text{ N}$

$T = F \cdot d$
 $T = (58,860)(150)$
 $T = 8,829,000 \text{ J}$

$T = F \cos \theta = d \cdot M$
 $T = (58,860)(0.48)(150)(0.65)$
 $T = 2,754,648$

5) $F = 12 \text{ N}$ $d = 7 \text{ m}$ Encontrar: a) Trabajo en la misma dirección
b) En la dirección contraria.

a) $T = F \cdot d$
 $T = (12)(7)$
 $T = 84 \text{ J}$

b) $T = F \cdot d$
 $T = (12)(7)$
 $T = 84 \text{ J}$



6 $m = 50 \text{ kg}$ $d = 8 \text{ m}$ Encontrar: a) Trabajo
b) Trabajo del muelle

$$\begin{aligned} a) F &= m \cdot g & T &= F \cdot d \\ F &= (50)(9.81) & T &= (490.5)(8) \\ F &= 490.5 \text{ N} & T &= 3924 \text{ J} \end{aligned}$$

b) El trabajo del muelle es el mismo

7 $V = 10 \text{ Dm}^3$ $d = 3 \text{ m}$ Encontrar: Trabajo

$$\begin{aligned} 10 \text{ Dm}^3 &\rightarrow \frac{1^3 \text{ m}^3}{10^3 \text{ Dm}^3} = 0.01 \text{ m}^3 & T &= f \cdot d \\ & & T &= (10 \text{ kg})(9.81)(3) \\ & & T &= 294.3 \text{ J} \\ F &= P \cdot m \cdot g & P &= 1000 \text{ kg/m}^3 \\ P_{\text{H}_2\text{O}} &= 1000 \text{ kg/m}^3 & P &= 10 \text{ kg} \end{aligned}$$

8 $m = 20 \text{ TON}$ $F = 20,000 \text{ N}$ $d = 36 \text{ km}$ Hallar: Trabajo/km.
Trabajo/h

$$\begin{aligned} F_{\text{Camion}} &= (20,000)(9.81) \\ F &= 1,962,000 \text{ N} \\ F &= 20,000 \text{ N} \\ F &= 1,982,000 \text{ N} \end{aligned}$$

$$\begin{aligned} T &= F \cdot d = (1,982,000 \text{ N})(1000) \\ T &= 1,982,000,000 \text{ J} \end{aligned}$$

9 $m = 65 \text{ kg}$ $d = 10 \text{ m}$ $F = 300 \text{ N}$ $d = 75 \text{ cm}$ Hallar: Trabajo

$$\begin{aligned} T_1 &= m \cdot g \cdot d \\ T_1 &= (65 \text{ kg})(9.81)(10 \text{ m}) \\ T_1 &= 6376.5 \text{ J} \\ T_2 &= (300 \text{ N})(0.75 \text{ m}) \\ T_2 &= 225 \text{ J} \\ T &= T_1 + T_2 \\ T &= 6376.5 + 225 \\ T &= 6601.5 \text{ J} \end{aligned}$$

10 $F = 24 \text{ Nw}$ $d = 10 \text{ mt}$ $\theta =$ a) 30°
 b) 90°
 c) 120°

$T = F \cdot d$
 $T = (24)(10)$
 $T = 240 \text{ J}$

a) $T = T \cos \theta$
 $T = 240 \cos 30^\circ$
 $T = (240)(0.8)$
 $T = 192 \text{ J}$

b) $T = T \cos \theta$
 $T = 240 \cos 90^\circ$
 $T = (240)(0)$
 $T = 0$

c) $T = T \cos \theta$
 $T = 240 \cos 120^\circ$
 $T = (240)(-0.5)$
 $T = -120 \text{ J}$

11 $m = 1500 \text{ kg}$ $d = 1500 \text{ cm}$ $t = 2 \text{ min}$. Hallar la potencia en:

a) W
 b) kW
 c) CV

$F = m \cdot g$ $T = F \cdot d$
 $F = (1500)(9.81)$ $T = (14,715)(15)$
 $F = 14,715 \text{ N}$ $T = 220,725 \text{ J}$

$P = \frac{T}{t}$ $\text{kW} = 1 \text{ kW} = 1000 \text{ W}$
 $P = \frac{220,725}{2}$ $1,834,375 \text{ W} = 1,834,375 \text{ W}$

$\text{CV} = 1 \text{ kW} = 1,33 \text{ CV}$
 $1,834,375 = 1,33 \text{ CV}$

12 $v = 50 \text{ km/h}$ $P = 40 \text{ CV}$ $d = 50 \text{ km}$ $t = 3,600 \text{ s}$ Hallar: Fuerza.

$P = \frac{T}{t}$ $F = \frac{T}{d}$
 $T = P \cdot t$ $T = 105,840,000 \text{ J}$
 $T = (29,700)(3,600)$
 $T = 105,840,000 \text{ J}$ $F = 2,116,800 \text{ Nw}$

13 $m = 350 \text{ kg}$ $d = 18 \text{ mt}$ $t = 40 \text{ s}$ Hallar: potencia en: a) W
 b) kW

$F = m \cdot g$ $T = F \cdot d$
 $F = (350)(9.81)$ $T = (3,433.5)(18)$
 $F = 3,433.5 \text{ Nw}$ $T = 61,803 \text{ J}$

$P = \frac{T}{t}$
 $P = \frac{61,803}{40}$
 $P = 1,545,075$

14 $m = 25000 \text{ kg}$ $d = 16 \text{ mt}$ $t = 5 \text{ min}$. Hallar: Potencia en CV

$$F = m \cdot g$$

$$F = (25,000)(9.81)$$

$$F = 245,250 \text{ N}$$

$$T = F \cdot d$$

$$T = (245,250)(1600)$$

$$T = 392,400,000$$

$$P = \frac{T}{t}$$

$$P = \frac{392,400,000}{500}$$

$$P = 784,800 \text{ W}$$

$$1 \text{ CV} = 735 \text{ W}$$

$$1,779.5 \text{ CV} = 1,308,000$$

15 $P = 20 \text{ CV}$ $v = 50 \text{ mt/min}$ $d = 50 \text{ mt}$ $t = 60 \text{ s}$ Hallar: Carga

$$P = \frac{T}{t}$$

$$T = P \cdot t$$

$$T = (19,700)(60)$$

$$T = 882,000 \text{ J}$$

$$T = F \cdot d$$

$$F = \frac{T}{d}$$

$$F = \frac{882,000}{50}$$

$$F = 17,640 \text{ N}$$

16 $P = 6 \text{ CV}$ $v = 25 \text{ km/h}$ $M = 0.2$ Hallar: peso

$$P = \frac{T}{t}$$

$$T = P \cdot t$$

$$T = (125.5)(3,600)$$

$$T = 451,800$$

$$T = F \cdot d$$

$$F = \frac{T}{d}$$

$$F = \frac{451,800}{25,000}$$

$$F = 17.64 \text{ N}$$

$$P = (17.64)(0.2)$$

$$P = 3.528 \text{ N}$$

19 $P = 250 \text{ kW}$ $m = 1,000 \text{ kg}$ Hallar: Velocidad

$$1 \text{ CV} = 76 \text{ kg m/s}$$

$$1 \text{ kW} = 133 \text{ CV}$$

$$P = 250 \text{ kW} \cdot \frac{1 \text{ CV}}{1.33 \text{ kW}}$$

$$P = 332.5 \text{ CV} \cdot \frac{76 \text{ kg m/s}}{1 \text{ CV}}$$

$$P = 25,270 \text{ kg m/s}$$

$$V = \frac{P}{m}$$

$$V = \frac{25,270}{1,000}$$

$$V = 25.27 \text{ mt/s}$$

18 $m = 1800$ $d = 300 \text{ mt}$ $t = 3 \text{ min.}$ Hallar: potencia.

$$F = m \cdot g$$

$$F = (1800)(9.81)$$

$$F = 17,658 \text{ N/W}$$

$$T = F \cdot d$$

$$T = (17,658)(300)$$

$$T = 5,297,400 \text{ J}$$

$$P = \frac{T}{t}$$

$$P = \frac{5,297,400}{180}$$

$$P = 29,430 \text{ W}$$

19 $m = 130 \text{ kg}$ $d = 10 \text{ mt}$ $t = 2 \text{ min.}$ Hallar: potencia.

$$F = m \cdot g$$

$$F = (130)(9.81)$$

$$F = 1,275.3 \text{ N/W}$$

$$T = F \cdot d$$

$$T = (1,275.3)(10)$$

$$T = 12,750 \text{ J}$$

$$P = \frac{T}{t}$$

$$P = \frac{12,750}{120}$$

$$P = 106,250 \text{ W}$$

20 $F = 1,275.3$ $d = 10 \text{ mt}$ tiempo = 60 s Hallar: potencia en CV

$$T = F \cdot d$$

$$T = (1,275.3)(10)$$

$$T = 12,753 \text{ J}$$

$$P = \frac{T}{t}$$

$$P = \frac{12,753}{60}$$

$$P = 212.55 \text{ W}$$

$$1 \text{ CV} = 735 \text{ W}$$

$$P = 212.55 \text{ W} = 0.289 \text{ CV}$$

21 $m = 2 \text{ kg}$ $h = 3 \text{ mt}$ $g = 10 \text{ mt/s}^2 = a) \text{ y } b)$

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

$$E_p = (2 \text{ kg})(10 \text{ mt/s}^2)(3 \text{ mt})$$

$$E_p = 60 \text{ J}$$

b) $f = m \cdot g$

$$f = (2 \text{ kg})(10)$$

$$f = 20 \text{ N}$$

22 $m = 200 \text{ kg}$ $v = 30 \text{ mt/s}$ $f = 500$ $d = ?$ $EC = ?$

$30 \text{ mt} = \begin{cases} d = 30 \text{ mt} \\ t = 1 \text{ seg} \end{cases}$

$$d = 30 \text{ mt}$$

$$EC = \frac{m \cdot v^2}{2}$$

$$EC = \frac{200 \times 30^2}{2}$$

$$EC = 90000$$

UBAK

23 $F = 12.5 \text{ kg}$ $d = 600 \text{ cm}$ $m = 250 \text{ kg}$

$$F = m \cdot g$$

$$F = (9.81)(12.5) = 122.625$$

$$(12.5)(600) = 7350 \quad EC = \frac{m \cdot v^2}{2}$$

$$F = m \cdot g$$

$$F = (12.5)(9.81)$$

$$F = 122.625 \text{ N}$$

$$EC = 7350$$

$$2EC = m \cdot v^2$$

$$v = \sqrt{\frac{(2)(7350)}{250}}$$

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

$$v = \sqrt{\frac{2 \cdot 7350}{250}}$$

$$v = \sqrt{\frac{2 \cdot EC}{m}}$$

$$v = \sqrt{58.8} = 2.42$$

$$v = 2.42$$

24 $EC = 6 \text{ gr}$ $v = 500 \text{ m/s}$

$$EC = \frac{m \cdot v^2}{2} = (0.06) \frac{(500)^2}{2} = 7500$$

25 $P = 3.6 \text{ N}$ $v = 18 \text{ m/s}$

$$P = m \cdot g$$

$$EC = \frac{m \cdot v^2}{2}$$

$$m = \frac{P}{g}$$

$$EC = \frac{(0.36)(169)}{2}$$

$$m = \frac{3.6}{9.81}$$

$$m = 0.36$$

$$EC = 30.42$$

26. $m = 5 \text{ kg}$

$E_c = 225 \text{ J}$

$$E_c = \frac{m \cdot v^2}{2}$$

$$v = \sqrt{\frac{2 \cdot (225)}{5}}$$

$$2 E_c = m \cdot v^2$$

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

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

$$v = 90$$

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

27. $m = 3 \text{ kg}$

$h = 2.5 \text{ m}$

$$E_p = m \cdot g \cdot h$$

$$E_p = (3)(9.81)(2.5) = 73.575$$

28. $m = 6 \text{ kg}$

$E_p = 80$

$$E_p =$$

$$H = \frac{80}{(6)(9.81)} = 1.36$$

$$H = \frac{E_p}{m \cdot g}$$

38.8

2a) $M = 5\text{ k}$ $h = 10\text{ m}$

$$EP = m \cdot g \cdot h$$

$$EP = (5) (9.81)(10) = 490.5\text{ EP}$$

b) **790.5**

$$EC = \frac{m \cdot v^2}{2}$$

$$EC =$$

$$0.8 = 0.0$$