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**Grupo: A**

EDUCAR

## **Problemario**

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### Problemas

1.  $F = 30 \text{ N}$   $d = 60 \text{ cm}$  a) Trabajo  
 $T = F \cdot d$  b) T. Mecánico  $\Theta = 300^\circ$   
 $T = (30)(0.6)$   $F = T \cos \Theta$   
 $T = 18$   $F = 18 \cos 300$   
 $F = 9$

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

2.  $m = 25 \text{ kg}$   $D = 6.4 \text{ mt}$  (encontrar trabajo)  
 $T = F \cdot d$   $F = P = m \cdot g$   
 $T = (160)(6.4)$   $F = P = (25)(64)$   
 $T = 1024$   $F = 160 \text{ N}$

3.  $F = 3 \text{ N}$   $d = 12,000 \text{ cm}$  (encontrar: trabajo)  
 $T = F \cdot d$   
 $T = (3)(12)$   
 $T = 36$

4.  $m = 6000 \text{ kg}$   $D = 150 \text{ mt}$   $\Theta = 200$   $M = 0.65$   
 $F = P = m \cdot g$   $T = F \cdot d$  a) Tensión  
 $F = P = (6000)(9.81)$   $T = (58,860)(150)$  b) trabajo  
 $F = P = 58,860$   $T = 8,829,000 \text{ J}$

$$T = F \cos \Theta \cdot d \cdot M$$
$$T = (58,860)(0.48)(150)(0.65)$$

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

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

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

6.  $m = 50 \text{ kg}$ ,  $d = 8 \text{ m}$  Encontrar a) Trabajo  
 b) Trabajo del mueble

a)  $F = m \cdot g$   
 $F = (50)(9.81)$   
 $F = 490.5 \text{ NW}$

$T = F \cdot d$   
 $T = (490.5)(8)$   
 $T = 3,924 \text{ J}$

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

$10 \text{ Dm}^3 \rightarrow \frac{10^3 \text{ m}^3}{10^3 \text{ Dm}^3} = 0.01 \text{ m}^3$

$\rho = \rho_e \cdot V$   
 $\rho = (1000)(0.01)$   
 $\rho = 10 \text{ kg}$

$T = F \cdot d$   
 $T = (10 \text{ kg})(9.81)(3)$   
 $T = 294.3 \text{ J}$

8.  $m = 20 \text{ TON}$ ,  $F = 20,000 \text{ NW}$ ,  $d = 36 \text{ km}$   
 # Camión =  $(20,000)(9.81)$  Hallar: Trabajo/km  
 Trabajo/h

$F_c = 1,462,000 \text{ N}$   
 $F = 20,000 \text{ N}$   
 $F = 1,982,000 \text{ J}$

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

$T_1 = m \cdot g \cdot d$   
 $T_1 = (65 \text{ kg})(9.81)(10 \text{ m})$   
 $T_1 = 6376.5 \text{ J}$

$T_2 = F \cdot d$   
 $T_2 = (300 \text{ N})(0.75 \text{ m})$   
 $T_2 = 225 \text{ J}$

$T = T_1 + T_2$   
 $T = 6376.5 + 225$   
 $T = 6601.5 \text{ J}$

10.  $F = 24 \text{ N}$   $d = 10 \text{ m}$   $\theta =$  a)  $30^\circ$   
 $T = F \cdot d$  a)  $T = T \cos \theta$  b)  $90^\circ$   
 $T = (24)(10)$   $T = 240 \cos 30$  b)  $1200$   
 $T = 240 \text{ J}$   $T = 192 \text{ J}$  b)  $T = T \cos \theta$   
 $T = 240 \cos 90$   
 $T = (240)(0)$   
 $T = 0$

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  
 $F = m \cdot g$   $T = F \cdot d$  an: a) W  
 $F = (1500)(9.81)$   $T = (14,715)(15)$  b) KW  
 $F = 14,715 \text{ N}$   $T = 220,725 \text{ J}$  c) CV  
 $P = \frac{T}{t}$   $1 \text{ KW} = 1000 \text{ W}$   
 $1.839575 \text{ KW} = 1.839.375 \text{ W}$   
 $1 \text{ CV} = 735 \text{ W}$   
 $1.239.375 = 2.44656875 \text{ CV}$

12.  $V = 50 \text{ km/h}$   $\rho = 40 \text{ cv}$   $d = 50 \text{ km}$   $t = 3,600 \text{ s}$   
Hallar: Fuerza  $P = \frac{T}{t}$   $T = P \cdot t$   
 $F = \frac{T}{d}$   $T = (129,460)(3,600)$   
 $T = 105,846,000 \text{ J}$   
 $F = \frac{105,846,000}{50}$   
 $F = 2,116,800 \text{ N}$

12.  $V = 50 \text{ km/h}$   $\rho = 40 \text{ cv}$   $d = 50 \text{ km}$   $t = 3,600 \text{ s}$   
 Hallar: Fuerza

13.  $m = 350 \text{ kg}$   $d = 18 \text{ mt}$   $t = 40 \text{ s}$  Hallar potencia

$F = m \cdot g$   
 $F = (350)(9.81)$   
 $F = 3,433.5 \text{ NW}$

$\rho = \frac{T}{t}$  a) w  
 b) kw

$T = F \cdot d$   
 $T = (3433.5)(18)$   
 $T = 61,803 \text{ J}$

$\rho = \frac{61,803}{40} = 1,545.075$

$\rho = 1,545.075$

14.  $m = 25000 \text{ kg}$   $d = 1.6 \text{ mt}$   $t = 5 \text{ min}$  Hallar potencia

$F = m \cdot g$   
 $F = (25,000)(9.81)$   
 $F = 245,250 \text{ NW}$

$T = F \cdot d$   
 $T = (245,250)(1.6)$   
 $T = 392,400,000$

$\rho = \frac{T}{t}$   $\rho = \frac{392,400,000}{300} = 1,308,000$

$1 \text{ cv} = 735 \text{ W}$   
 $1,779.5 \text{ cv} = 1,308,000$

15.  $\rho = 20 \text{ cv}$   $V = 50 \text{ mt/min}$   $d = 50 \text{ mt}$   $t = 60 \text{ s}$  Hallar

$\rho = \frac{T}{t}$   $T = F \cdot d$   
 $T = \rho \cdot t$   $T = F \cdot d$   
 $T = F \cdot d$

$T = \rho \cdot t$   
 $T = (17,700)(60)$   
 $T = 882,000 \text{ J}$

$\rho = \frac{882,000}{50}$   
 $\rho = 17,640 \text{ NW}$

16.  $P = 6 \text{ cv}$   $V = 25 \text{ km/h}$   $m = 0.2$  Hallar:  $P$  en  $\text{kg}$

$$P = \frac{T}{t} \quad T = P \cdot t \quad t = F \cdot d$$

$$T = (125.5)(3,600) \quad F = P$$

$$T = 451,800 \quad P = F = \frac{T}{d}$$

$$P = (17.68)(0.2)$$

$$P = 3528 \text{ NW}$$

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

$$P = 1768 \text{ NW}$$

17.  $P = 256 \text{ kw}$   $m = 1,000 \text{ kg}$  Hallar: Velocidad

$$1 \text{ cv} = 76 \text{ kg mt/s} \quad P = 250 \text{ kw} \quad \frac{1 \text{ cv}}{1.33 \text{ kw}}$$

$$1 \text{ kw} = 13.3 \text{ cv} \quad P = 332.5 \text{ cv} \quad \frac{76 \text{ kg mt/s}}{1 \text{ cv}} = 25.2 \text{ Tons}$$

$$V = \frac{P}{m} \quad v = \frac{25270}{1000} \quad V = 25.27 \text{ mt/s}$$

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

$$F = m \cdot g \quad T = F \cdot d \quad P = \frac{T}{t}$$

$$F = (1800)(9.81) \quad T = (17,698)(300)$$

$$F = 17,658 \text{ NW} \quad T = 5,297,400 \text{ J} \quad P = \frac{5,247,400}{180}$$

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

19.  $m = 130$   $d = 100 \text{ mt}$   $t = 2 \text{ min}$  Hallar:

$$F = m \cdot g \quad T = F \cdot d \quad P = \frac{T}{t}$$

$$F = (130)(9.81) \quad T = (1275.3)(10)$$

$$F = 1,275.3 \text{ NW} \quad T = 12,750 \text{ J} \quad P = \frac{12,750}{120}$$

$$P = 106,275 \text{ w}$$

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

$$T = F \cdot d$$

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

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

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

$$2.881 \text{ CV}$$

$$P = \frac{T}{t} = \frac{12,753}{60} = P = 212.55 \text{ W}$$

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

a)  $GP = m \cdot y \cdot h$   
 $GP = (2 \text{ kg})(10 \text{ m/s}^2)(3 \text{ m})$   
 $GP = 60 \text{ J}$

b)  $F = m \cdot g$   
 $F = 20$   
 $F = 20 \times 3$   
 $F = 60$

22.  $m = 200 \text{ kg}$   $v = 30 \text{ m/s}$   $F = 500$   $d = ?$   $GC = ?$

$$30 \text{ m/s} = \frac{d = 30 \text{ m}}{t = 150 \text{ s}}$$

$$GC = \frac{m \cdot v^2}{2} = \frac{200 \times 30^2}{2} = 90000$$

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

$$t = F \cdot m \quad t = (9.81)(12.5) = 122.62$$

$$(122.6)(600) = 735.60 \quad GC = \frac{m \cdot v^2}{2}$$

$$F = m \cdot g$$

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

$$F = 122.6 \text{ N}$$

$$V = \sqrt{\frac{2(735.75)}{250}}$$

$$V = \sqrt{5.886} = 2.2$$

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

$$260 = \frac{m \cdot v^2}{2}$$

$$\frac{260}{m} = v^2$$

$$v = \sqrt{\frac{260}{m}}$$

24.  $G_c = 6 \text{ gr}$   $V = 500 \text{ ml/s}$   
 $G_c = \frac{m \cdot v^2}{2} = 6c = \frac{(0.06)(300)^2}{2} = 7500$

25.  $\rho = 3.6 \text{ NW}$   $V = 13 \text{ m/s}$   
 $\rho = m \cdot g$   $m = 0.36$   $E_c = \frac{m \cdot v^2}{2}$   
 $m = \frac{\rho}{g}$   
 $m = \frac{3.6}{9.81}$   
 $6c = \frac{(0.36)(166)^2}{2}$   
 $\rho = 3642$

26.  $m = 5 \text{ kg}$   $E_c = 225 \text{ J}$   
 $G_c = \frac{m \cdot v^2}{2}$   
 $260 = \frac{m \cdot v^2}{2}$   
 $260 = v^2$   
 $v = \sqrt{\frac{260}{m}}$   
 $v = \sqrt{(2)(225)}$   
 $v = \sqrt{90}$   
 $v = 9.48$

27.  $G_p = 3 \text{ kg}$   $h = 2.5 \text{ m}$   
 $G_p = m \cdot g \cdot h$   
 $E_p = (3)(9.81)(2.9) = 73.57$

28.  $m = 6 \text{ kg}$   $E_p = 80$   
 $G_p =$   $H = 80 = 1.36$   
 $H = \frac{E_p}{m \cdot g} = \frac{80}{(6)(9.81)}$

$$29. m = 5 \text{ kg} \quad h = 10 \text{ m}$$

$$G.P. = m \cdot g \cdot h$$

$$G.P. = (5)(9.8)(10) = a) 490.5 \text{ G.P.}$$

$$b) 490.5$$