



# Mi Universidad

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## > PROBLEMATICO <

1. Datos

$$F = 30 \text{ Nw}$$

$$d = 60 \text{ cm} = 0.6 \text{ m}$$

$$\theta = 30^\circ$$

$$T = F \cdot d$$

$$T = (30)(0.6)$$

$$T = 18 \text{ J}$$

$$T = F \cos \theta \cdot d$$

$$T = (30 \text{ Nw})(\cos 30^\circ)(0.6 \text{ m})$$

$$T = 15 \text{ J}$$

2. Datos

$$m = 25 \text{ kg}$$

$$d = 6.4 \text{ m}$$

$$g = 9.81 \text{ m/s}^2$$

$$T = F \cdot d$$

$$F = m \cdot g$$

$$T = m \cdot g \cdot d$$

$$T = (25)(9.81)(6.4)$$

$$T = 1569.6 \text{ J}$$

3. Datos

$$F = 3 \text{ Nw}$$

$$d = 1200 \text{ cm} = 12 \text{ m}$$

$$T = F \cdot d$$

$$T = (3)(12)$$

$$T = 36 \text{ J}$$

4. Datos

$$D = 6000 \text{ kg}$$

$$d = 150 \text{ m}$$

$$\theta = 20^\circ$$

$$m = 0.65$$

$$g = 9.81$$

$$F = m \cdot g$$

$$F = (0.65)(9.81)$$

$$T = 6.37 \text{ Nw}$$

$$T = F \cos \theta \cdot d$$

$$T = (6.37)(\cos 20^\circ)(150)$$

$$T = (6.37)(0.939)(150)$$

$$T = 897.21 \text{ J}$$

5. Datos

$$F = 12 \text{ Nw}$$

$$d = 7 \text{ mt}$$

$$T = F \cdot d$$

$$T = (12)(7)$$

$$T = 84 \text{ J}$$

6. Datos

$$M = 50 \text{ kg}$$

$$d = 8 \text{ mt}$$

$$g = 9.81$$

$$T = F \cdot d$$

$$F = P = m \cdot g$$
  
$$(50 \text{ kg})(9.81)$$

$$F = 490.5 \text{ Nw}$$

$$T = (490.5)(8)$$

$$T = 3924 \text{ J}$$

$$D = 490.5$$

$$T = 3924 \text{ J}$$

7. Datos

$$m = 10 \text{ dm}^3 = 0.5 \text{ kg}$$

$$d = 3 \text{ mt}$$

$$g = 9.81 \text{ mt/l}^2$$

$$T = F \cdot d$$

$$T = (4.90)(3 \text{ mt}) = F = P \cdot g$$

$$(14.71)$$

$$(0.5)(9.81)$$

$$F = 4.90$$

8. Datos

$$m = 20 \text{ ton} = 20000 \text{ kg}$$

$$F = 20000 \text{ Nw}$$

$$V = 36 \text{ km/hr}$$

$$T = 3600 \text{ seg}$$

$$T = F \cdot d$$

$$T = (20000)(9.81)(36000)$$

$$T_1 = (m \cdot g \cdot d)$$

$$T_1 = (20000)(9.81)(36000)$$

$$T_1 = 7,063,200,000 \text{ J}$$

$$T_2 = \frac{m \cdot g \cdot d}{1000}$$

$$T_2 = \frac{(20000)(9.81)(36000)}{1000}$$

$$T_2 = 7,063,200 \text{ J}$$

$$T_3 = \frac{(20000)(9.81)(36000)}{3600}$$

$$T_3 = \frac{m \cdot g \cdot d}{3600}$$

$$T_3 = 1,962,000 \text{ J}$$

9. Datos

m = 65 kg

F = 200 w

d = 10 m

75 cm = 0.75 m

T<sub>1</sub> = F · d = 2000 J

T<sub>2</sub> = m · g · d = 478.2375 J

T<sub>T</sub> = 2478.2375 J

10.

a) T = F cos α<sub>1</sub> d = 120

b) T = F cos α<sub>2</sub> d = -240

c) T = F cos α<sub>3</sub> d = -120

11. Datos

m = 1500 kg

d = 1500 cm = 15 m

t = 2 min = 120 seg

g = 9.81

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

P = (1500 kg) (9.81) (15)

120 seg

P = 1829.375 w

$\frac{1829.375 \text{ w} \cdot 1 \text{ kw}}{1000 \text{ w}} = P = 1.829 \text{ kw} \cdot \frac{1.33 \text{ cv}}{1 \text{ kw}}$

P = 2.44 cv

12. Datos

V = 50 km/hr

P = 40 cv

$V = \frac{d}{t} = \frac{d = 50 \text{ km} = 50000 \text{ m}}{t = 1 \text{ hr} = 3600 \text{ seg}}$

P = 40 cv

$D = \frac{I}{t}$

$40 \text{ cv} \cdot \frac{1 \text{ kw}}{1.33 \text{ cv}} = 30.07$

(30,070) (3600)

50000

t = F · d

$30.07 \text{ kw} \cdot \frac{1000 \text{ w}}{\text{kw}}$

P · t = F · d

20166.04 w

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

P = 30070

13. Datos

m = 350 kg

d = 18 m

t = 40 seg

g = 9.81

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

$\frac{1545.075 \text{ w}}{1000} \text{ kw}$

P = (350) (9.81) (18)

40

P = 1.545 kw

P = 1,545.075 cv

#### 14. Datos

$$m = 25000 \text{ kg}$$

$$d = 1.6 \text{ km}$$

$$t = 5 \text{ min}$$

$$F = \frac{m \cdot g \cdot d}{t} = \frac{(25000)(9.81)(1600)}{300}$$

$$F = \frac{1308000}{1000} = 1,308 \text{ w}$$

$$1308 \times 1.33 = 1,739.64 \text{ cv.}$$

#### 15. Datos

$$P = 20 \text{ cv}$$

$$V = 50 \text{ mt/min}$$

$$d = 50 \text{ mt}$$

$$t = 1 \text{ seg}$$

$$T = d \cdot t$$

$$t = (20 \text{ cv})(1)$$

$$t = 20 = 15 \text{ kw} = 15000 \text{ w}$$

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

$$F = \frac{15000}{50} = 300$$

$$m = \frac{15000}{9.81} = 1529.05$$

$$P = m \cdot g = P = (1529.05)(9.81) \quad P = 15000 \text{ w}$$

#### 16. Datos

$$P = 6 \text{ cv} = 6 / 1.33 = 4.511 \text{ kw} = 4511 \times 1000 = 4,511 \text{ w}$$

$$V = 25$$

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

$$T = P \cdot t$$

$$F = 0.2$$

$$T = (4.511)(3600)$$

$$d = 25000$$

$$T = 16,239,600 \text{ J} \times 2 = 32,479,200$$

$$t = 3600$$

$$T = P \cdot d$$

$$P = P = \frac{t}{d} = \frac{32,479,200}{25000} = 1299.17 \text{ w}$$

#### 17. Datos

$$m = 1000$$

$$P = 250$$

$$250 \text{ kw} \cdot 1.33 \text{ w} = 332.5 \text{ cv} \cdot 75 \text{ kg} = 24,937.5$$

$$v = \frac{d}{m}$$

$$v = \frac{24,937.5}{1000}$$

$$= V = 24.9375 \text{ mt/s}$$

#### 18. Datos

$$m = 80 \times 10 = 800 \text{ kg} + 1000 \text{ kg} = 1800 \text{ kg} \times 9.81 = 17,658$$

$$d = 300$$

$$t = 3 \text{ min}$$

$$17,658 \times d = \frac{50,297,400}{180} = 279,430 \text{ w}$$

19. Datos

m = 180

d = 10

t = 2 min = 120 seg

g = 9.81

P = m · g · d / t

P = (180)(9.81)(10) / 120 = 106.275

20. Datos

d = 10 mt

t = 1 min = 60 seg

g = 9.81

106.275 = 212.65 w

0.212 kw = 1.33

0.281 cv

21. Datos

m = 2 kg

g = 10 mt / sec<sup>2</sup>

d = 3 mt

E<sub>p</sub> = m · g · d

E<sub>p</sub> = (2)(10)(3) = 60 J

F = m · g

F = (2)(10) = 20 nw

T = F · d

T = (20)(3) = 60 J

22. Datos

m = 200 kg

v = 30

F = 800

F · d =  $\frac{mv^2}{2}$   
d = 20

d =  $\frac{(200)(30)^2}{2(800)}$  = d = 180 mt

E<sub>c</sub> =  $\frac{m \cdot v^2}{2}$

E<sub>c</sub> =  $\frac{(200)(30)^2}{2}$  = 900,000 J

23. Datos

F = 12.5

d = 600 cm = 6 mt

m = 250 kg

F = (12.5)(9.81)

F = 122.6 nw

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

v =  $\frac{\sqrt{2(122.6)(6)}}{250}$

v = 2.4 mt/s

24. Datos

v = 500 mt/s

m = 600

E<sub>c</sub> =  $\frac{m \cdot v^2}{2}$  E<sub>c</sub> =  $\frac{(600)(500)^2}{2}$

E<sub>c</sub> = 750,000 J

25. Datos

$$d = 3.6$$

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

$$m = \frac{3.6}{9.81} = 0.36$$

$$V = 13$$

$$g = 9.81$$

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

$$E_c = \frac{(0.36)(13)^2}{2}$$

$$E_c = 30.42 \text{ J}$$

26. Datos

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

$$E_c = 225 \text{ J}$$

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

$$v = 9.48$$

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

$$2E_c = v^2$$

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

27. Datos

$$m = 3$$

$$d = 2.5$$

$$g = 9.81$$

$$E_p = m \cdot g \cdot d = 73.575 \text{ J}$$

28. Datos

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

$$E_p = 80 \text{ J}$$

$$g = 9.81$$

$$E_p = m \cdot g \cdot d$$

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

$$h = \frac{80}{(6)(9.81)}$$

$$h = 1.3591 \text{ m}$$

29. Datos

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

$$d = 10 \text{ m}$$

$$g = 9.81 \text{ m/s}^2$$

$$E_p = m \cdot g \cdot d$$

$$E_p = (5)(9.81)(10)$$

$$E_p = 490.5 \text{ J}$$

$$v^2 = 2 \cdot g \cdot d$$

$$v = \sqrt{2 \cdot g \cdot d}$$

$$v = \sqrt{2(9.81)(10)}$$

$$v = 14.014 \text{ m/s}$$

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

$$E_c = \frac{(5)(14.014)^2}{2}$$

$$E_c = 490.98 \text{ J}$$