



Mi Universidad

Problematario

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Nombre del tema: Dinamica

Parcial: I

Nombre de la Materia: Física II

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PROBLEMARIO

Nombre: Lizzy Fernanda Dominguez León
Desarrollo
Actividad

1. Datos

$$F_1 = 30 \text{ NW}$$
$$d = 60 \text{ cm}$$
$$= 0.6$$
$$F_2 = 4 \text{ } 300^\circ$$

a) Trabajo: 18 J

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

b) Trabajo mecánico: 9.3

$$b) F = T \cos \theta$$
$$F = 18 \cos 30$$
$$F = 15.57$$
$$T = F \cdot d$$
$$T = (15.57)(0.6)$$
$$T = 9.3 \text{ J}$$

2. Datos

$$m = 25 \text{ kg}$$
$$d = 6.4 \text{ mt}$$
$$g = 9.81 \text{ mt/s}^2$$

a) Trabajo: 1569.6 J

$$F = P = m \cdot g$$
$$F = P = (25 \text{ kg})(9.81 \text{ mt/s}^2)$$
$$F = P = 245.25 \text{ NW}$$

$$T = F \cdot d$$
$$T = (245.25 \text{ NW})(6.4 \text{ mt})$$
$$T = 1569.6 \text{ J}$$

3. Datos

$$F = 3 \text{ NW}$$
$$d = 1200 \text{ cm}$$
$$= 12 \text{ mt}$$

a) Trabajo: 36 J

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

4. Datos

$$m = 6000 \text{ kg}$$
$$d = 150 \text{ mt}$$
$$\theta = 200$$
$$H = 0.65$$
$$g = 9.81 \text{ mt/s}^2$$

a) Tensión: 58.860 NW

$$F = m \cdot g$$
$$F = P = (6000 \text{ kg})(9.81 \text{ mt/s}^2)$$
$$F = P = 58.860 \text{ NW}$$

$$T = F \cdot d$$
$$T = (58.860 \text{ NW})(150 \text{ mt})$$
$$T = 8,829,000 \text{ J}$$

b) Trabajo: 5,337,150.5 J

$$T = F \cos \theta \cdot d \cdot H$$
$$T = (58.860 \text{ NW})(0.93)(150 \text{ mt})(0.65)$$
$$T = 5,337,150.5 \text{ J}$$

5. Datos

$$F = 12 \text{ NW}$$
$$d = 7 \text{ mt}$$

a) Misma dirección: 84 J

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

b) Dirección contraria: 84 J

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

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6. Datos

$$m = 50 \text{ kg}$$
$$d = 8 \text{ mt}$$
$$g = 9.81 \text{ m/s}^2$$

a) Trabajo: 490.5 J

$$F = m \cdot g$$
$$F = (50 \text{ kg})(9.81 \text{ m/s}^2)$$
$$F = 490.5 \text{ N}$$

b) Peso del mueble: 392.4 J

$$T = F \cdot d$$
$$T = (490.5 \text{ N})(8 \text{ mt})$$
$$T = 3924 \text{ J}$$

7. Datos

$$V = 10 \text{ dm}^3 \frac{1^3}{10^3} \frac{\text{m}^3}{\text{dm}^3} = 0.01 \text{ m}^3$$
$$d = 3 \text{ mt}$$
$$T = ?$$

$$F = P \cdot m \cdot g$$
$$P_{\text{agua}} = 1000 \text{ kg/m}^3$$

b) Trabajo del agua: 294.3 J

$$P = \rho \cdot V$$
$$P = (1000 \text{ kg/m}^3)(0.01 \text{ m}^3)$$
$$P = 10 \text{ kg}$$

$$T = F \cdot d$$
$$T = (10 \text{ kg})(9.81 \text{ m/s}^2)(3 \text{ mt})$$
$$T = 294.3 \text{ J}$$

8. Datos

$$m = 20 \text{ TON} = 20000 \text{ kg}$$
$$F = 20000 \text{ N}$$
$$V = 36 \text{ km/hr}$$
$$d = 36000 \text{ mt}$$
$$t = 3600 \text{ seg}$$

a) Trabajo km: 1982000

$$F_{\text{comien}} = (20000 \text{ kg})(9.81 \text{ m/s}^2)$$
$$F_c = 196200 \text{ N}$$
$$F = 20000 \text{ N}$$
$$F_r = 198200 \text{ N}$$

b) Trabajo Hr: 1982000

$$T = F \cdot d = (198200 \text{ N})(1000 \text{ m})$$
$$T = 198200000 \text{ J}$$

9. Datos

$$m = 65 \text{ kg}$$
$$d = 10 \text{ mt}$$
$$F = 300 \text{ N}$$
$$dc = 75 \text{ cm}$$

a) Trabajo: 6601.5

$$T_1 = m \cdot g \cdot d$$
$$T_1 = (65 \text{ kg})(9.81 \text{ m/s}^2)(10 \text{ mt})$$
$$T_1 = 6376.5 \text{ J}$$
$$T_2 = (300 \text{ N})(0.75 \text{ mt})$$
$$T_2 = 225 \text{ J}$$

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

10. Datos

$$F = 24 \text{ N}$$
$$d = 10 \text{ mt}$$

- a) 300
b) 900
c) 1200

Trabajo: a) 120 J b) 0 J c) -120 J

$$a) T = F \cdot d$$
$$T = (24 \text{ N})(5 \text{ m})$$
$$T = 120 \text{ J}$$

$$c) T = F \cdot d$$
$$T = (24 \text{ N})(-5 \text{ m})$$
$$T = -120 \text{ J}$$

$$b) T = F \cdot d$$
$$T = (24 \text{ N})(0)$$
$$T = 0 \text{ J}$$

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

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11. Datos

$m = 1500 \text{ kg}$
 $d = 1500 \text{ cm} = 15 \text{ mt}$
 $t = 2 \text{ min} = 120 \text{ seg}$
 $g = 9.81 \text{ m/s}^2$

$P = \frac{T}{t}$
 $P = \frac{220,325 \text{ N}}{120 \text{ seg}}$

$F = m \cdot g$
 $F = (1500 \text{ kg})(9.81 \text{ m/s}^2)$
 $F = 14715 \text{ N}$

$P = 1839.375 \text{ w}$
 $1839.375 \text{ w} \cdot \frac{1}{1000} \frac{\text{kw}}{\text{w}} = 1.839.375 \text{ kw}$
 $1839.375 \text{ kw} \cdot \frac{1.22}{1} \frac{\text{cv}}{\text{kw}} = 2246.36815$

$T = F \cdot d$
 $T = (14715)(15 \text{ mt})$
 $T = 220,325 \text{ Nm}$

a) w 1839.375 b) kw 1.839.375 c) cv 2246.36815

12. Datos

$v = 50 \text{ km/hr}$
 $= 40 \text{ cv}$
 $d = 50$
 $t = 3600 \text{ s}$

a) Fuerza, 2116800 N

$P = \frac{T}{t}$
 $T = P \cdot t$
 $T = (29400)(3600)$
 $T = 105,840,000 \text{ J}$

$F = \frac{T}{d}$
 $F = \frac{105,840,000}{50}$
 $F = 2,116,800 \text{ N}$

a) w 1595.075 b) kw 1.595075

13. Datos

$m = 350 \text{ kg}$
 $d = 18 \text{ mt}$
 $t = 40 \text{ s}$
 $g = 9.81 \text{ m/s}^2$

$F = m \cdot g$
 $F = (350 \text{ kg})(9.81 \text{ m/s}^2)$
 $F = 3433.5 \text{ N}$

$T = F \cdot d$
 $T = (3433.5)(18 \text{ mt})$
 $T = 61803 \text{ J}$

$P = \frac{T}{t}$
 $P = \frac{61803}{40 \text{ s}}$
 $P = 1545.075 \text{ w}$

$1545.075 \text{ w} \cdot \frac{1}{1000} \frac{\text{kw}}{\text{w}}$
 $= 1.545075 \text{ kw}$

14. Datos

$m = 25000 \text{ kg}$
 $d = 1.6 \text{ mt}$
 $t = 6 \text{ min}$

a) CV 1379.5

$F = m \cdot g$
 $F = (25000)(9.81)$
 $F = 245,250 \text{ N}$

$T = F \cdot d$
 $T = (245,250)(1.6 \text{ m})$
 $T = 392,400 \text{ J}$

$P = \frac{T}{t}$
 $P = \frac{392,400 \text{ J}}{300 \text{ s}}$

$1 \text{ cv} = 735 \text{ w}$
 $1379.5 \text{ w} = 1308 \text{ cv}$

$P = 1308 \text{ cv}$

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13. Datos

$P = 20 \text{ cv}$
 $V = 50 \text{ m}^3/\text{min}$
 $d = 50 \text{ mt}$
 $t = 60 \text{ s}$

a) Fuerza de carga 11640 N

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

$$T = F \cdot d$$

$$F = P$$

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

$$P = F \cdot \frac{882000}{50}$$

$$T = (19700)(60)$$

$$T = 882000 \text{ J}$$

$$P = 17640 \text{ Nw}$$

16. Datos

$D = 6 \text{ cv}$
 $V = 25 \text{ km/h}$
 $M = 0.2$

a) P_{cv} 3528 Nw

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

$$T = F \cdot d$$

$$F = P$$

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

$$P = F \cdot \frac{951800}{25000}$$

$$T = (125.5)(3600)$$

$$T = 451800 \text{ J}$$

$$P = 17.64 \text{ Nw}$$

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

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

17. Datos

$P = 250 \text{ kw}$
 $m = 1000 \text{ kg}$

a) Velocidad: 25.27

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

$$1 \text{ kw} = 1.33 \text{ cv}$$

$$P = 250 \text{ Nw}$$

$$1 \text{ cv} = 1.33 \text{ kw}$$

$$P = 337.5 \text{ cv} \cdot \frac{76 \text{ kg m/s}}{1 \text{ cv}} = 25,270 \text{ kg m/s}$$

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

$$V = \frac{25,270}{1000}$$

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

18. Datos

$m = 1800$
 $d = 300 \text{ mt}$
 $t = 3 \text{ min}$

a) Potencia: 29430 w

$$F = m \cdot g$$

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

$$F = 17658 \text{ Nw}$$

$$T = F \cdot d$$

$$T = (17658)(300)$$

$$T = 5297400 \text{ J}$$

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

$$P = \frac{5297400}{180} = 29430 \text{ w}$$

19. Datos

$m = 130 \text{ kg}$
 $d = 10 \text{ mt}$
 $t = 2 \text{ min}$

a) Potencia: 106275 w

$$F = m \cdot g$$

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

$$F = 1275.3 \text{ Nw}$$

$$T = F \cdot d$$

$$T = (1275.3)(10)$$

$$T = 12750 \text{ J}$$

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

$$P = \frac{12750}{120}$$

$$P = 106.275 \text{ w}$$

20. Datos

$F = 1275.3$
 $d = 1$
 $t = 60 \text{ s}$

a) Patencia CV: 0.2822

$$T = F \cdot d$$

$$T = (1275.3)(10 \text{ mt})$$

$$T = 12753 \text{ J}$$

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

$$P = \frac{12753}{60}$$

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

$$1 \text{ cv} = 735 \text{ w}$$

$$0.2822 = 212.55 \text{ w}$$

21. Datos

m = 2 kg
h = 3 mt
EP = ?
g = 10 m/s²

a) EP = 60 J

$$EP = m \cdot g \cdot h$$
$$EP = (2 \text{ kg}) (10 \text{ m/s}^2) (3 \text{ mt})$$
$$EP = 60 \text{ J}$$

b) Trabajo = 60 J

$$(2 \text{ kg}) (10 \text{ m/s}^2)$$
$$F = 20$$
$$F = 20 \times 3$$
$$F = 60 \text{ J}$$

22. Datos

M = 200 kg
v = 30 m/s
F = 500 N
d = ?
EC = ?

a) Distancia

$$EC = \frac{m \cdot v^2}{2}$$
$$EC = \frac{200 \text{ kg} \cdot 900}{2}$$
$$EC = 90000$$

b) EC = 90,000 J

23. Datos

F = 12.5 kg
d = 500 cm
m = 250 kg
g = 9.81 m/s²

a) Velocidad 2.42

$$V = \frac{P}{m} \quad T = (122.6)(6)$$
$$T = 735.75 \text{ J}$$
$$EC = T = 75 \text{ J}$$
$$2EC = m \cdot v^2$$
$$\frac{2EC}{m} = v^2$$
$$v = \sqrt{\frac{2EC}{m}}$$

$$v = \sqrt{\frac{(2)(75.75)}{250}}$$
$$v = \sqrt{\frac{151.5}{250}}$$
$$v = \sqrt{0.606}$$
$$v = 0.78$$

24. Datos

EC = 6 J
V = 500 m/s

a) EC = 75,000 J

$$EC = T = \frac{m \cdot v^2}{2}$$
$$EC = 75,000$$

25. Datos

P = 3.6 W
V = 13 m/s
EC = ?

a) EC = 30.42 J

$$EC = mv^2 \quad P = m \cdot g$$
$$\frac{P}{g} = m \quad \frac{3.6}{9.81} = 0.36$$
$$\frac{(0.36)(13^2)}{2} = 30.42$$

26. Datos

m = 5 kg
EC = 225 J
g = 9.81 m/s²

a) Velocidad 9.48

$$EC = \frac{m \cdot v^2}{2}$$
$$2EC = m \cdot v^2$$
$$\frac{2EC}{m} = v^2$$
$$v = \sqrt{\frac{2EC}{m}}$$
$$v = \sqrt{\frac{2(225)}{5}}$$
$$v = \sqrt{90}$$
$$v = 9.48$$

27. Datos

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

$$h = 2.5 \text{ m}$$

a) $EP = 73.5 \text{ J}$

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

$$EP = (3)(9.8)(2.5)$$

$$EP = 73.5 \text{ J}$$

28. Datos

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

$$EP = 80$$

29. Datos

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

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

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

$$EC = ?$$

a) Energía Cinética 490.5 J

$$Fd = \frac{m \cdot v^2}{2} = mgh$$

$$T = EC = EP$$

$$\downarrow \quad \downarrow \quad \downarrow$$

$$J - J - J$$

$$= 490.5 \text{ J}$$