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Grado: 5 to

Grupo: Bachillerato-Enfermeria

Actividad: Problemario

The logo for Universidad de San Andrés (UDS) is located in the top right corner. It consists of the letters "UDS" in a bold, dark blue, sans-serif font, centered within a thin black rectangular border.



## Problemas:

Rulian Osvaldo Gámez Méndez

① Datos:

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

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

$$\theta = 30^\circ$$

$$T = F \cdot d$$

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

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

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

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

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

② Datos:

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

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

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

$$T = F \cdot d$$

$$T = m \cdot g$$

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

$$T = (25 \text{ kg})(9.81 \text{ m/s}^2)(6.4 \text{ m})$$

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

③ Datos:

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

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

$$T = F \cdot d$$

$$T = (3 \text{ Nw})(12 \text{ m})$$

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

④ Datos:

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

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

$$\theta = 20^\circ$$

$$m = 0.65$$

$$g = 9.81$$

$$F = m \cdot g$$

$$F = (0.65)(9.81 \text{ m/s}^2)$$

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

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

$$T = (6.37 \text{ Nw})(0.934)(150 \text{ m})$$

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

⑤ Datos!

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

⑥ Datos!

$$m = 50 \text{ Kg} \quad T = F \cdot d$$
$$d = 8 \text{ m} \quad F = \rho = m \cdot g$$
$$g = 9.81 \quad (50 \text{ Kg})(9.81 \text{ m/s}^2)$$
$$F = 490.5 \text{ Nw}$$

$$F = 490.5 \quad T = (490.5)(8)$$
$$T = 3924 \text{ J} \quad T = 3924 \text{ J}$$

⑦ Datos!

$$m = 10 \text{ Dm}^3 = 0.5 \text{ Kg} \quad T = F \cdot d$$
$$d = 3 \text{ m} \quad F = (4.90)(3 \text{ m}) = F = \rho \cdot g$$
$$g = 9.81 \text{ m/s}^2 \quad (0.5)(9.81)$$
$$F = 4.90$$

8) Datos:

$$m = 20 \text{ Ton} = 20,000 \text{ Kg}$$

$$F = 20,000 \text{ Nw}$$

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

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

$$T = F \cdot d$$

$$T = (20,000)(9.81)(3,600)$$

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

$$T_1 = (20,000)(9.81)(36,000)$$

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

$$m \cdot g \cdot d$$

$$T_2 = 1000$$

$$\frac{(20,000)(9.81)(36000)}{1000}$$

$$1000$$

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

$$m \cdot g \cdot d$$

$$T_3 = 3600$$

$$\frac{(20,000)(9.81)(36,000)}{3,600}$$

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

9) Datos:

$$m = 65 \text{ kg}$$

$$F = 3000 \text{ Nw}$$

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

$$75 \text{ cm} = 0.75 \text{ m}$$

$$T_1 = F \cdot d = 3,000 \text{ J}$$

$$T_2 = m \cdot g \cdot d = 478.2375 \text{ J}$$

$$T_T = 3,478.2375 \text{ J}$$

10) Datos:

$$a) 300 \quad b) 400 \quad c) 1200$$

$$a) T = F \cos \alpha_1 d = 120$$

$$b) T = F \cos \alpha_2 d = -240$$

$$c) T = F \cos \alpha_3 d = 120$$

11) Datos:

$$m = 1500 \text{ kg}$$

$$d = 1500 \text{ cm} = 15 \text{ m}$$

$$t = 2 \text{ min} = 120 \text{ seg}$$

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

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

$$(1500 \text{ kg}) (9.81 \text{ m/s}^2) (15 \text{ m})$$

$$P = 120 \text{ kg}$$

$$P = 1839.375 \text{ w}$$

$$1839.375 \text{ w} \cdot \frac{1 \text{ kw}}{1000 \text{ w}}$$

$$P = 1.839 \text{ kw}$$

$$1.839 \text{ kw} \cdot \frac{1.33 \text{ C.V.}}{1 \text{ kw}}$$

$$P = 244 \text{ C.V.}$$

12) Datos:

$$V = 50 \text{ km/hr}$$

$$P = 40 \text{ C.V.}$$

$$d = 50 \text{ km} = 50,000 \text{ m}$$

$$V = \frac{d}{t} \quad t = 1 \text{ hr} = 3,600 \text{ seg}$$

$$P = 40 \text{ C.V.}$$

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

$$40 \text{ C.V.} \cdot \frac{1 \text{ kw}}{1.33 \text{ C.V.}} = 30.07$$

$$P \cdot t = T$$

$$T = F \cdot d$$

$$P \cdot t = F \cdot d$$

$$30.07 \text{ kw} \cdot \frac{1000 \text{ w}}{1 \text{ kw}}$$

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

$$P = 30,070 \text{ w}$$

$$\frac{(30,070 \text{ w}) (3600 \text{ seg})}{50,000} = 2,165.04 \text{ Nw}$$

13) Datos:

$$m = 350 \text{ kg}$$

$$d = 18 \text{ m}$$

$$t = 40 \text{ seg}$$

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

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

$$P = \frac{(350 \text{ kg}) (9.81 \text{ m/s}^2) (18 \text{ m})}{40 \text{ seg}}$$

$$P = 1,545.075 \text{ w}$$

$$1,545.075 \text{ w} \times \frac{1 \text{ kw}}{1000 \text{ w}}$$

$$P = 1.545 \text{ kw}$$

14) Datos:

$$m = 25,000 \text{ kg}$$

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

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

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

$$F = \frac{(25,000) (9.81) (1,600)}{300}$$

$$F = \frac{1,308,000}{1000} \text{ w} = 1,308 \text{ kw}$$

$$1,308 \times 1.33 = 1739.64 \text{ C.v.}$$

15) Datos:

$$P = 20 \text{ C.V.}$$

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

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

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

$$T = P \cdot t$$

$$T = (20 \text{ C.V.}) (1 \text{ seg})$$

$$T = 20 = 15 \text{ kw} = 15,000 \text{ w}$$

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

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

$$F = \frac{15,000}{50}$$

$$m = \frac{15,000}{9.81}$$

$$F = 300$$

$$m = 1529.05$$

$$P = m \cdot g \quad P = (1529.05)(9.81) \quad P = 15,000 \text{ Nw}$$

16) Datos:

$$P = 6 \text{ C.V.} = 6 \cdot 1.33 = 4.511 \text{ kw} = 4.511 \times 1000 = 4,511 \text{ w}$$

$$V = 25 \text{ km/hr}$$

$$F = 0.2$$

$$d = 25,000 \text{ m}$$

$$t = 3,600 \text{ seg}$$

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

$$T = P \cdot t$$

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

$$T = 16,239,000 \text{ J} \times 2 = 3,247,800$$

$$T = F \cdot d$$

$$P = F = \frac{T}{d} = \frac{3,247,800}{25,000} = 129.912 \text{ Nw}$$



17) Datos:

$$250 \text{ kw} \frac{1.33 \text{ w}}{1 \text{ kw}} = 332.5$$

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

$$m = 1000 \text{ kg}$$

$$332.5 \text{ C.V} \frac{75 \text{ kg m/s}}{1 \text{ C.V}} = 24,937.5 \text{ kg m/s}$$

$$V = \frac{p}{m} \quad V = \frac{24,937.5}{1000}$$

$$V = 24.93 \text{ m/s}$$

19) Datos:

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

$$m = 130 \text{ kg}$$

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

$$t = 2 \text{ min} = 120 \text{ seg}$$

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

$$p = \frac{(130)(9.81)(10)}{120} = 106.275 \text{ w}$$

18) Datos:

$$m = 8 \text{ kg} \times 10 = 800 \text{ kg} + 1000 \text{ kg} = 1800 \text{ kg} \times 9.81 = 17,658$$

$$d = 300 \text{ m}$$

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

$$17,658 \times d = \frac{5,297,400}{180} = 29,430 \text{ w}$$

20) Datos:

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

$$t = 1 \text{ min} = 6 \text{ seg}$$

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

$$106.275 = 212.65 \text{ w}$$

$$0.212 \text{ Kw} \times 1.33$$

$$0.281 \text{ C.V.}$$

21 Datos:

$$m = 2 \text{ Kg}$$

$$g = 10 \text{ m/seg}^2$$

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

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

$$E_p = (2 \text{ kg})(10 \text{ m/seg}^2)(3 \text{ m})$$

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

$$F = m \cdot g$$

$$F = (2 \text{ kg})(10 \text{ m/s}^2)$$

$$F = 20 \text{ Nw}$$

$$T = F \cdot d$$

$$T = (20 \text{ Nw})(3 \text{ m})$$

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

22 Datos:

$$m = 200 \text{ Kg}$$

$$v = 30 \text{ m/seg}$$

$$F = 500 \text{ Nw}$$

$$F \cdot d = \frac{m v^2}{2}$$

$$d = \frac{m v^2}{2 F}$$

$$d = \frac{(200)(30)^2}{2(500)}$$

$$d = 180 \text{ m}$$

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

$$E_c = \frac{(200)(30)^2}{2}$$

$$E_c = 90,000 \text{ J}$$

23) Datos:

$$v = \frac{\sqrt{2 F d}}{m}$$

$$F = 12.5 \text{ Kg}$$

$$d = 600 \text{ cm} = 6 \text{ m}$$

$$m = 250 \text{ Kg}$$

$$v = \sqrt{2(122.6 \text{ Nw})(6 \text{ m})}$$

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

$$v = 24 \text{ m/s}$$

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

24) Datos:

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

$$v = 500 \text{ m/s}$$

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

$$E_c = \frac{(6 \text{ gr})(500 \text{ m/s})^2}{2}$$

$$E_c = 750,000 \text{ J}$$

25) Datos:

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

$$p = 3.6 \text{ Nw}$$

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

$$v = 13 \text{ m/s}$$

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

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

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

$$E_c = 3042 \text{ J}$$

26) Datos:

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

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

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

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

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

$$v = 9.48$$

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

27) Datos:

$$E_p = m \cdot g \cdot d = 73.57 \text{ J}$$

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

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

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

28) Datos:

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

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

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

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

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

$$h = \frac{80 \text{ J}}{(6 \text{ kg})(9.81 \text{ m/s}^2)}$$

$$h = 1.359 \text{ m}$$

29 Datos:

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

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

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

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

$$E_p = (5 \text{ Kg}) (9.81 \text{ m/s}^2) (10 \text{ m})$$

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

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

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

$$v_f = \sqrt{(2)(9.81 \text{ m/s}^2)(10 \text{ m})}$$

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

$$E_c = 1/2 \cdot m \cdot v^2$$

$$E_c = \frac{(5 \text{ Kg}) (14.014 \text{ m/s})^2}{2}$$

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