



Mi Universidad

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5to semestre

Enfermería bachillerato

09 noviembre

PROBLEMATARIO

- 1. a) El esfuerzo
- b) Deformación unitaria
- c) Módulo de Young.

Datos:

$$d = 3.5 \text{ mt} \quad F = m \cdot g = (300 \text{ kg}) (9.81 \text{ mt/s}^2)$$

$$A = 1.5 \text{ cm}^2 \quad F = 2943 \text{ N} \cdot \frac{100000 \text{ DIN}}{\text{N}}$$

$$\Delta L = 0.07 \text{ cm} \quad F = 29430000 \text{ DIN}$$

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

$$A) \epsilon = \frac{F}{A} = \frac{29430000 \text{ DIN}}{1.5 \text{ cm}^2}$$

$$\epsilon = 1,962,000 \text{ DIN/cm}^2 = 1.92 \times 10^6 \text{ DIN/cm}^2$$

$$B) \Delta L = \frac{\Delta L}{L} = \frac{0.07}{350 \text{ cm}} \quad A \Delta L = 2 \times 10^{-4}$$

$$C) \gamma = \frac{F \Delta L}{A \Delta L} = \frac{(29430000 \text{ DIN})(350 \text{ cm})}{(1.5 \text{ cm}^2)(2 \times 10^{-4})}$$

$$\gamma = 1,373,400$$

2: a) Su compresión

b) Tensión

$$T = m \cdot g$$

Datos

$$T = (50) (9.81)$$

$$d = 2.7 \text{ mt} \rightarrow 270 \text{ cm}$$

$$T = 490.5 \text{ N} \cdot \frac{100000 \text{ DIN}}{\text{N}}$$

$$A = 0.15 \text{ cm}^2$$

$$T = 49050000$$

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

$$Y = 19 \times 10^4 \text{ DIN/cm}^2$$

$$A) \gamma = \frac{F \Delta L}{A \Delta L} \rightarrow \Delta L = \frac{F \cdot A}{A \cdot Y}$$

$$E = 20 \times 10^8 \text{ DIN/cm}^2$$

$$\Delta L = \frac{49050000 \text{ DIN} (270 \text{ cm})}{(0.15 \text{ cm}^2) (19 \times 10^4 \text{ DIN/cm}^2)}$$

$$B) \epsilon = \frac{F}{A} \rightarrow F = T \rightarrow T = \epsilon \cdot A$$

$$(20 \times 10^8 \text{ DIN/cm}^2) (0.15) \quad \Delta L = 0.040 \text{ cm}$$

$$T = 30000000 \text{ DIN} \cdot \frac{100000 \text{ N}}{\text{DIN}}$$

$$T = 3000 \text{ N} =$$

$$9.81$$

$$m = 305.91 \text{ kg}$$

3-a) Deformación

b) Tensión

Datos.

$$L = 1.2 \text{ m}$$

$$A = 0.22 \text{ cm}^2$$

$$m = 4.10 \text{ kg}$$

$$E = 15 \times 10^8 \text{ DIN/cm}^2$$

$$y = 18 \times 10 \text{ DIN/cm}^2$$

$$T = (4.10)(9.81)$$

$$T = 40.221$$

$$A) A = (0.222)(1 \text{ cm}/10 \text{ mm})^2 = 0.222 \text{ mm}^2$$

$$T = 40.221 = 2.68 \times 10^8 \text{ cm}$$

$$E = 15 \times 10^8$$

$$B) T = Cd(P)$$

$$\frac{T}{A} = (2.68 \times 10^8 \text{ cm})(15 \times 10^8 \text{ DIN/cm}^2)$$

$$T = 40.05 \text{ DIN/cm}^2$$

$$T = (40.05) \left(\frac{1 \text{ kg}}{2.2 \text{ in}} \right)$$

$$T = 4.08 \text{ kg}$$

4: Datos.

$$L = 125 \text{ cm}$$

$$A = 2.5 \text{ cm}^2$$

$$d = 0.5 \times 10^{-4}$$

$$V = 7 \times 10^{-4} \text{ m/cm}^2$$

$$d = \frac{FL}{AY} \quad F = \frac{AYd}{L}$$

$$F = \frac{(0.5 \times 10^{-4} \text{ cm}^2)(2.5 \text{ cm}^2)(7 \times 10^{-4} \text{ DIN/cm}^2)}{125 \text{ cm}}$$

$$F = 700000 \text{ DIN}$$

5: Datos

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

$$d = 790 \text{ kg/m}^3$$

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

$$V = 1.26 \text{ m}^3$$

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

$$790 \text{ kg/m}^3$$

6: Datos

$$P = 3000 \text{ new}$$

$$P_e = 9016 \text{ new/m}^2$$

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

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

$$V = \frac{3000}{9016}$$

$$V = 0.332 \text{ m}^3$$

7: Datos

$$P = 19300 \text{ kg/m}^3$$

$$y = g \cdot d$$

$$y = (9.81)(19300)$$

$$y = 189333 \text{ N/m}^3$$

8. Datas

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

$$V = 0.13274 \text{ m}^3$$

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

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

$$0.13274 \text{ m}^3$$

$$\rho = 11300.28 \text{ kg/m}^3$$

9. Datas

$$A = 0.3 \text{ m}^2$$

$$P = 420 \text{ new/m}^2$$

$$P = \frac{F}{A}$$

$$F = P \cdot A \quad F = (420)(0.3)$$

$$F = 126 \text{ new}$$

10. Datas

$$\rho = 8 \times 10^4 \text{ new/m}^2$$

$$P = \rho \cdot g \cdot h$$

$$h = \frac{P}{\rho \cdot g}$$

$$h = \frac{(8 \times 10^4)}{(1025)(9.81)}$$

$$(1025)(9.81)$$

$$h = 795.60 \text{ m}$$

11. Datas

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

$$d = 1000 \text{ kg/m}^3$$

$$P = d \cdot g \cdot h$$

$$P = (1000)(9.81)(6)$$

$$P = 58860 \text{ pa}$$

12. Datas

$$h = 0.9 \text{ m}$$

$$P = 680 \text{ kg/m}^3$$

$$P = \rho \cdot g \cdot h$$

$$\rho = (680)(9.81)(0.9)$$

$$P = 6003.72 \text{ kpa}$$

