

Fisika.

1.) Dik : = 50 cm
= 200 gr

Bertambah panjang = 65 cm
= 5 mm²

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

Dit : Tentukan . a.) Tegangan, b.) Regangan,
c.) Modulus Elasticit.

Dijawab :

$$a.) = \frac{F}{\Delta}$$

$$= \frac{0,2 \cdot 10 \text{ N}}{5 \cdot 10^{-9} \text{ m}^2}$$

$$= 0,4 \cdot 10^9 \text{ N/m}^2$$

$$b.) e = \frac{\Delta L}{L_0} = \frac{0,15}{0,5} = \frac{15}{50} = 0,3 \text{ m}$$

$$c.) E = \frac{G}{e} = \frac{4 \cdot 10^8}{0,3} = \frac{4}{3} = 10^9 \text{ N/m}^2$$

2.) Dik : $AL = 10 \text{ cm}$

$$L_0 = 2,5 \text{ m}$$

$$L_1 = 2,7 \text{ m}$$

$$= 4 \cdot 10^3 \text{ Li/m}^2$$

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

Ditanya : $m = \dots ?$

Dijawab :

$$Y = \frac{F \times L_0}{A \times \Delta L}$$

$$AL = L_1 - L_0$$

$$= 2,7 - 2,5$$

$$= 0,2 \text{ m}$$

$$\Delta = \frac{1}{4} \pi d^2$$

$$= \frac{1}{4} \pi 10^2$$

$$4$$

$$\begin{aligned}
 &= 25 \pi = 78,5352 \\
 &= 78,540 \text{ cm}^2 \\
 &= 78,54 \cdot 10^{-9} \text{ m}
 \end{aligned}$$

$$Y = \frac{F \times L_0}{A \times \Delta L}$$

$$\begin{aligned}
 F &= \frac{Y A \cdot \Delta L}{L_0} = \frac{214^5 \times 78,54 \cdot 10^{-9} \cdot 0,12}{2,5} \\
 &= 2,51 \cdot 3 \text{ m}
 \end{aligned}$$

$$F = m \cdot g$$

$$m = \frac{F}{g} = \frac{2,513}{10} = 0,251 \text{ kg}$$

3. Dik : $k_1 = 100 \text{ N/m}$
 $k_2 = 150 \text{ N/m}$
 $k_3 = 300 \text{ N/m}$
 $\Delta x = 20 \text{ cm} = 0,2 \text{ m}$

Dit : $m = \dots ?$

$$\text{Dijawab : } \frac{1}{h_s} = \frac{1}{h_1} + \frac{1}{h_2} + \frac{1}{h_3}$$

$$\frac{1}{h_s} = \frac{1}{100} + \frac{1}{150} + \frac{1}{300}$$

$$\frac{1}{h_s} = \frac{3 + 2 + 1}{300}$$

$$\frac{1}{h_s} = \frac{6}{300} \Rightarrow h_s : \frac{300}{6} = 50 \text{ N/m}$$

$$F = h \cdot \Delta x$$

$$\begin{aligned}
 F &= 50 \cdot 0,2 \\
 &= 10 \text{ N}
 \end{aligned}$$

$$F = m \cdot g$$

$$\rightarrow m = \frac{F}{g} = \frac{10}{10} = 1 \text{ kg}$$

Lanjutan Tugas Fisika.

No.

Date

4. Dik : $k_1 = k_2 = k_3 = 300 \text{ N/m}$

Dit : Besar tetapan pegas ... ?

Jawab : \Rightarrow Susunan seri.

$$\frac{1}{k_p} = \frac{1}{k_1} + \frac{1}{k_2}$$

$$\frac{1}{k_p} = \frac{1}{300} + \frac{1}{300}$$

$$= \frac{2}{300}$$

$$k_p = 150$$

\Rightarrow Susunan paralel :

$$k = k_1 + k_2$$

$$= 150 \text{ N/m} + 150 \text{ N/m}$$

$$= 300 \text{ N/m}$$

maka tetapan pengganti = 300 N/m

5. Dik : $l_x = 1 \text{ m}$

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

$$F_x = F_y = F$$

$$\Delta l_x = 0,15 \text{ mm}$$

$$\Delta l_y = 1 \text{ mm}$$

$$d_y = 2 d_x$$

$$d_x = d_x$$

ditanya = $Y_x = Y_y \dots ?$

Jawab :

$$Y_x = \frac{F_x \cdot l_x}{A \cdot \Delta l_x} = \frac{1}{d_x = 0,15}$$

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$$\frac{1}{2} \pi d_x^2 \Delta l_x = \frac{1}{2}$$

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