



Aluno:

P1

Disciplina:

MECÂNICA DOS SÓLIDOS I

Turma:

2006.1

Professor:

F. ROCHINA

GABARITO

1ª. QUESTÃO:

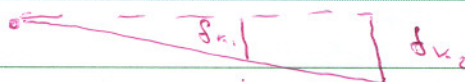
EQUILÍBRIO:



$$R + F_{k1} + F_{k2} = P$$

$$F_{k1} a + F_{k2} (2a) - P a = 0$$

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SEMELHANÇA DE TRIÂNGULOS

$$\frac{\delta_{k1}}{\delta_{k2}} = \frac{a}{2a}$$

COMPORTAMENTO MATERIAL $F_{k1} = k \delta_{k1}$; $F_{k2} = k \delta_{k2}$

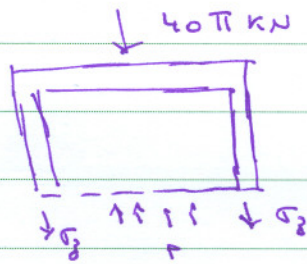
$$P a = k a \frac{\delta_{k2}}{2}$$

$$\Delta = \frac{\delta_{k2} c}{2a} \rightarrow \frac{P}{\Delta} = \frac{20k}{9}$$

$$\rightarrow \boxed{c = \frac{3}{2} a}$$

2ª. QUESTÃO

EQUILÍBRIO NA DIREÇÃO Z



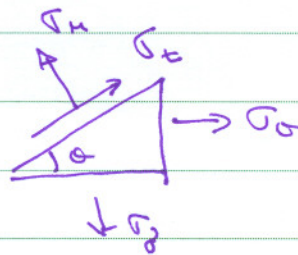
$$\sigma_z 2\pi R t + 40\pi k = p \pi R^2$$

$$\sigma_z = \frac{1}{2} \frac{(-40k + pR^2)}{Rt} = 32 \text{ MPa}$$

EQUILÍBRIO EM θ : $\sigma_\theta = \frac{pR}{t} = 68 \text{ MPa}$

$$\# \begin{cases} \sigma_r = 0 \rightarrow \text{TENSÃO PLANA} \\ \sigma_{\theta\theta} = \sigma_{zz} = \sigma_{r\theta} = 0 \end{cases}$$

• PLANOS DA SOLDADA



$$\tan \theta = \frac{3}{4}$$

$$\sigma_M = \sigma_\theta \cos^2 \theta + \sigma_z \sin^2 \theta = 45 \text{ MPa}$$

$$\sigma_t = \sigma_z - \sigma_\theta \sin \theta \cos \theta = 17 \text{ MPa}$$