

Opmerkingen: Zie §4.8, blz. 178 t/m 183

Antwoorden:

a. $\sigma_A = -30\sigma$

$\sigma_B = -6\sigma$

$\sigma_C = +18\sigma$

$\sigma_D = +18\sigma$

c. Vergelijking neutrale lijn: $z = 2y$

Toelichting:

Doorsnede grootheden:

$$I_{yy} = \frac{1}{12}t(4a)^3 + \frac{1}{12}2t(2a)^3 = \frac{20}{3}a^3t$$

$$I_{zz} = 4at(a)^2 + \frac{1}{12}2t(2a)^3 + 4at(a)^2 = \frac{26}{3}a^3t$$

$$a. \quad \sigma(y, z) = \frac{(-80\sigma a^2 t) \times y}{\frac{20}{3}a^3 t} + \frac{(+52\sigma a^2 t) \times z}{\frac{26}{3}a^3 t}$$

$$\sigma_A = \frac{(-80\sigma a^2 t)(+2a)}{\frac{20}{3}a^3 t} + \frac{(+52\sigma a^2 t)(-a)}{\frac{26}{3}a^3 t} = -30\sigma$$

$$\sigma_B = \frac{(-80\sigma a^2 t)(+a)}{\frac{20}{3}a^3 t} + \frac{(+52\sigma a^2 t)(+a)}{\frac{26}{3}a^3 t} = -6\sigma$$

$$\sigma_C = \frac{(-80\sigma a^2 t)(-a)}{\frac{20}{3}a^3 t} + \frac{(+52\sigma a^2 t)(+a)}{\frac{26}{3}a^3 t} = +18\sigma$$

$$\sigma_D = \frac{(-80\sigma a^2 t)(-a)}{\frac{20}{3}a^3 t} + \frac{(+52\sigma a^2 t)(-2a)}{\frac{26}{3}a^3 t} = +18\sigma$$

c. Vergelijking neutrale lijn: $\sigma(y, z) = 0 \Rightarrow z = 2y$