

Opmerkingen: Zie §3.1.4, voorbeeld 4, blz. 77 en 78
 Zie §3.2.4, voorbeeld 8, blz. 106 t/m 109

Antwoorden:

a. $A = \alpha R^2$
 b. $S_y = \frac{2}{3} R^3 \sin \alpha$
 $S_z = 0$
 c. $y_C = \frac{2}{3} R \frac{\sin \alpha}{\alpha}$
 $z_C = 0$
 d. $I_{yy} = \frac{1}{8} R^4 (\sin 2\alpha + 2\alpha)$
 $I_{zz} = \frac{1}{4} \alpha R^4$
 $I_{yz} = I_{zy} = 0$
 e. $I_{yy;\text{eigen}} = \frac{1}{8} R^4 (\sin 2\alpha + 2\alpha) - \frac{4}{9} R^4 \frac{\sin^2 \alpha}{\alpha}$
 $I_{zz;\text{eigen}} = \frac{1}{4} \alpha R^4$
 $I_{yz;\text{eigen}} = I_{zy;\text{eigen}} = 0$

Controle antwoorden:

$\alpha = \frac{\pi}{2}$ (halve cirkeldoorsnede):
 $A = \frac{\pi}{2} R^2$; $S_y = \frac{2}{3} R^3$; $S_z = 0$
 $y_C = \frac{4R}{3\pi}$ en $z_C = 0$
 $I_{yy} = I_{zz} = \frac{\pi R^4}{8}$ en $I_{yz} = I_{zy} = 0$
 $I_{yy;\text{eigen}} = R^4 \left(\frac{\pi}{8} - \frac{8}{9\pi} \right)$ en $I_{zz;\text{eigen}} = \frac{\pi R^4}{8}$
 $I_{yz;\text{eigen}} = I_{zy;\text{eigen}} = 0$

$\alpha = \pi$ (hele cirkeldoorsnede):
 $A = \pi R^2$; $S_y = S_z = 0$
 $I_{yy} = I_{zz} = \frac{1}{4} \pi R^4$ en $I_{yz} = I_{zy} = 0$
 $y_C = z_C = 0$
 $I_{yy;\text{eigen}} = I_{zz;\text{eigen}} = \frac{1}{4} \pi R^4$
 $I_{yz;\text{eigen}} = I_{zy;\text{eigen}} = 0$