

Remarks: See §3.2.4, example 7, pages 114 till 115

Answers 3.27-1:

a. $I_{yy} = 25,6 \times 10^9 \text{ mm}^4$

b. $I_{zz} = 35,2 \times 10^9 \text{ mm}^4$

c. $I_{yz} = 21,6 \times 10^9 \text{ mm}^4$

Explanation 3.27-1:

The cross-section is divided into a flange and a web.
Lengths in mm:

$$I_{yy} = \left\{ \frac{1}{12} \times 200 \times 600^3 + 200 \times 600 \times 300^2 \right\} + \left\{ \frac{1}{12} \times 600 \times 200^3 + 600 \times 200 \times 300^2 \right\}$$

$$I_{zz} = \left\{ \frac{1}{12} \times 600 \times 200^3 + 600 \times 200 \times 100^2 \right\} + \left\{ \frac{1}{12} \times 200 \times 600^3 + 200 \times 600 \times 500^2 \right\}$$

$$I_{yz} = \{ 600 \times 200 \times (+300) \times (+100) \} + \{ 200 \times 600 \times (+300) \times (+500) \}$$

Answers 3.27-2:

a. $I_{yy} = 3,28 \times 10^6 \text{ mm}^4$

b. $I_{zz} = 3,52 \times 10^6 \text{ mm}^4$

c. $I_{yz} = 2,16 \times 10^6 \text{ mm}^4$

Explanation 3.27-2:

The cross-section divided into a big rectangle and a small
“negative” rectangle. Lengths in mm:

$$I_{yy} = \left\{ \frac{1}{12} \times 80 \times 60^3 + 80 \times 60 \times 30^2 \right\} - \left\{ \frac{1}{12} \times 60 \times 40^3 + 60 \times 40 \times 30^2 \right\}$$

$$I_{zz} = \left\{ \frac{1}{12} \times 60 \times 80^3 + 60 \times 80 \times 40^2 \right\} - \left\{ \frac{1}{12} \times 40 \times 60^3 + 40 \times 60 \times 50^2 \right\}$$

$$I_{yz} = \{ 60 \times 80 \times (+30) \times (+40) \} - \{ 40 \times 60 \times (+30) \times (+50) \}$$