Remarks: See §3.1.3 pages 77 till 82
See §3.1.4, example 5, pages 87 till 90

Answers:

a is the distance from the NC to the top of the profile.

3.5-1. $a = 10$ mm

3.5-2. $a = 12,5$ mm

3.5-3. $a = 220$ mm

3.5-4. $a = 300$ mm

Explanation:

Dividing the cross-section into two rectangles, flange and web:

3.5-1.

$$a = \frac{(40\times 10\text{ mm}^2)(5\text{ mm}) + (10\times 20\text{ mm}^2)(20\text{ mm})}{(40\times 10\text{ mm}^2) + (10\times 20\text{ mm}^2)} = 10\text{ mm}$$

3.5-2.

$$a = \frac{(50\times 10\text{ mm}^2)(5\text{ mm}) + (10\times 30\text{ mm}^2)(25\text{ mm})}{(50\times 10\text{ mm}^2) + (10\times 30\text{ mm}^2)} = 12,5\text{ mm}$$

3.5-3.

$$a = \frac{(600\times 200\text{ mm}^2)(100\text{ mm}) + (200\times 400\text{ mm}^2)(400\text{ mm})}{(600\times 200\text{ mm}^2) + (200\times 400\text{ mm}^2)} = 220\text{ mm}$$

3.5-4.

$$a = \frac{(900\times 200\text{ mm}^2)(100\text{ mm}) + (300\times 600\text{ mm}^2)(500\text{ mm})}{(900\times 200\text{ mm}^2) + (300\times 600\text{ mm}^2)} = 300\text{ mm}$$