

Primjer 7.7

Homogena žica savijena je u obliku prema slici 7.12. Treba odrediti koordinate težišta S, ako su dimenzije na slici u centimetrima.

Rješenje:

Duljina žice (linije):

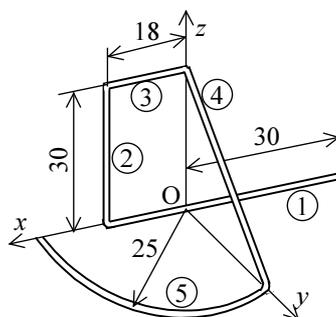
$$l = \sum_{i=1}^5 l_i = 48 + 30 + 18 + 39,05 + 39,27 = 174,32 \text{ cm.}$$

Koordinate težišta S linije l su:

$$x_s = \frac{1}{l} \cdot \sum_{i=1}^5 x_{si} l_i = \frac{1}{174,32} \cdot [-6 \cdot 48 + 18 \cdot 30 + 9 \cdot 18 + 15,916 \cdot 39,27], \quad x_s = 5,96 \text{ cm.}$$

$$y_s = \frac{1}{l} \cdot \sum_{i=1}^5 y_{si} l_i = \frac{1}{174,32} \cdot [12,5 \cdot 39,05 + 15,916 \cdot 39,27], \quad y_s = 6,385 \text{ cm.}$$

$$z_s = \frac{1}{l} \cdot \sum_{i=1}^5 z_{si} l_i = \frac{1}{174,32} \cdot [15 \cdot 30 + 30 \cdot 18 + 15 \cdot 39,05], \quad z_s = 9,04 \text{ cm.}$$



Slika 7.12

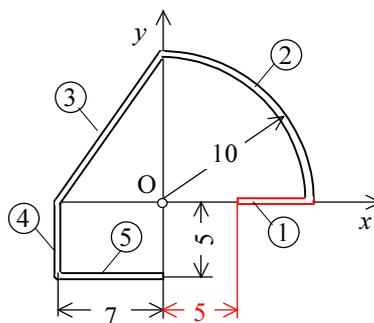
Primjer 7.8

Za liniju u xy -ravnini oblika prema slici 7.13 odrediti koordinate težišta S, ako su dimenzije na slici u centimetrima.

Rješenje:

Duljina linije jest:

$$l = \sum_{i=1}^5 l_i = 5 + 15,708 + 12,207 + 5 + 7 = 44,915 \text{ cm.}$$



Slika 7.13

Koordinate težišta S linije l su:

$$x_s = \frac{1}{l} \cdot \sum_{i=1}^5 x_{si} l_i = \frac{1}{44,915} \cdot [7,5 \cdot 5 + 6,366 \cdot 15,708 - 3,5 \cdot 12,207 - 7 \cdot 5 - 3,5 \cdot 7],$$

$$y_s = \frac{1}{l} \cdot \sum_{i=1}^5 y_{si} l_i = \frac{1}{44,915} \cdot [6,366 \cdot 15,708 + 5 \cdot 12,207 - 2,5 \cdot 5 - 5 \cdot 7].$$

Slijedi:

$$x_s = 0,785 \text{ cm}, \quad y_s = 2,528 \text{ cm.}$$