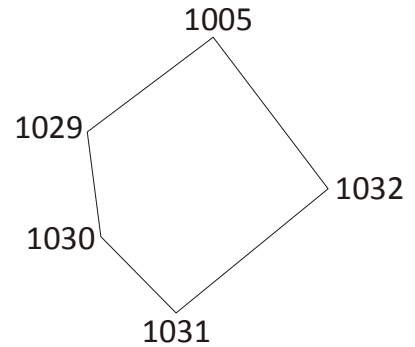


Computation of area and length using coordinates obtained from analogue maps

Exercise 1. Compute the area of the parcel and the length of the boundary lines using the coordinates of the nodes. (6 points):

Point ID	E	N
1005	650321.12	231429.67
1032	650364.44	231374.55
1030	650250.30	231346.59
1031	650291.01	231313.68
1029	650244.68	231401.71



Point ID	Coordinates		Length	Area
	E	N		
The area of the parcel:				

Solution:

Point ID	Coordinates		Length	Area
	E	N		
1005	321.12	429.67		
1032	364.44	374.55	70,11	-18894,03
1031	291.01	313.68	95,38	-19948,62
1030	250.30	346.59	52,35	8907,26
1029	244.68	401.71	55,41	13641,65
1005	321.12	429.67	81,39	7909,88
The area of the parcel:				8383,86 m2

Computation of area and length using coordinates obtained from analogue maps

Exercise 2. Compute the real area of the parcel, supposing that the coordinates stemmed from a cadastral map, where the distances between the closest control marks are the following: (3 points)

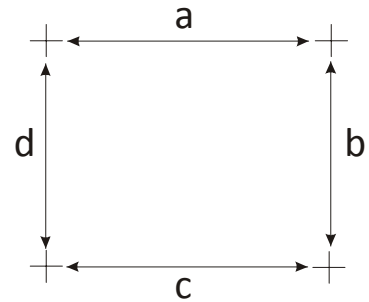
$$A_{\text{measured}} = 9000 \text{ m}^2$$

$$a = 99.8 \text{ mm}$$

$$b = 101.0 \text{ mm}$$

$$c = 100.8 \text{ mm}$$

$$d = 98.1 \text{ mm}$$



The current and the original area of the rectangle formed by the control marks:

$$A_{\text{current}} = \frac{a+c}{2} \frac{b+d}{2} = 9984.86 \text{ mm}^2$$

$$A_{\text{original}} = 100 \cdot 100 = 10000.00 \text{ mm}^2$$

The area distortion coefficient:

$$\tau = \frac{A_{\text{original}}}{A_{\text{current}}} = 1.001516$$

The real area of the parcel:

$$A_{\text{parcel}} = \tau \cdot A_{\text{measured}} = 9013.64 \text{ m}^2$$