

TRADE OF PLASTERING

PHASE 2

Module 2

External Work

UNIT: 5

Sand and Cement Panel

Produced by

SOLAS

An tSeirbhís Oideachais Leanúnaigh agus Scileanna
Further Education and Training Authority

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Introduction

Welcome to this section of your course which is designed to introduce you the learner, quadrilaterals and calculate job costs

Unit Objective

By the end of this unit each apprentice will be able to:

- Interpret and draw quadrilaterals
- Estimate and calculate job costs

1.0 Interpret and Draw Quadrilaterals

Key Learning Points

- Quadrilaterals - definitions, terms, types and method of construction
- Perimeters and areas of quadrilaterals

1.1 Quadrilaterals

Rhombus

A rhombus has all the properties of a parallelogram except that its sides are of equal length. The diagonals AD and BC bisect at right angles and divide the rhombus into four congruent triangles. The area of a rhombus can be found by multiplying the base by the perpendicular height, as we did for the parallelogram.

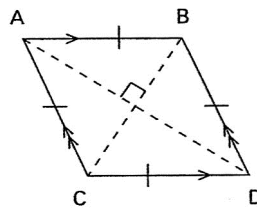


Figure 1

Trapezium

A trapezium is a quadrilateral that has two unequal parallel sides. It can be divided with a diagonal into two triangles. The area of the trapezium can be calculated as the sum of the areas of these two triangles, providing the height and the lengths of the two parallel sides are known.

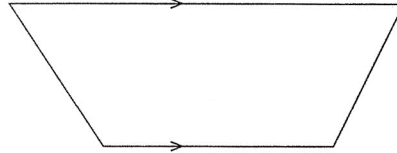


Figure 2

Example:

Find the area of the trapezium shown in Figure 3. The trapezium has been divided into two triangles, a and b .

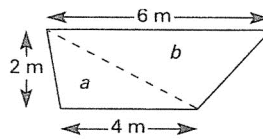


Figure 3

$$\text{Area of triangle } a = \frac{2 \times 4}{2} = 4\text{m}^2$$

$$\text{Area of triangle } b = \frac{2 \times 6}{2} = 6\text{m}^2$$

$$\begin{aligned} \text{Area of trapezium} &= \text{Area of triangle } a + \text{Area of triangle } b \\ &= 4\text{m}^2 + 6\text{m}^2 \\ &= 12\text{m}^2 \end{aligned}$$

Exercise:

(a) Find the angles x and y in the quadrilaterals shown in Figure 4.

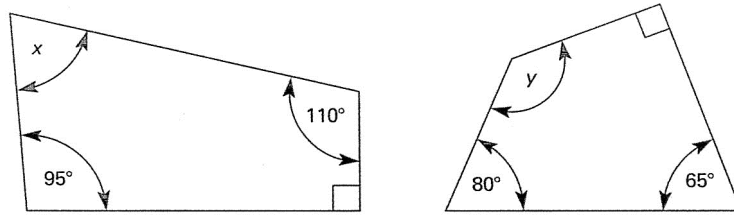


Figure 4

(b) Find the angles x , y and z and the area of the parallelogram shown in Figure 5.

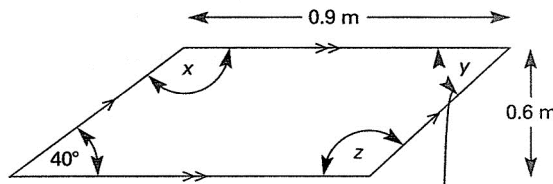


Figure 5

(c) Find the area of the building plot shown in Figure 6.

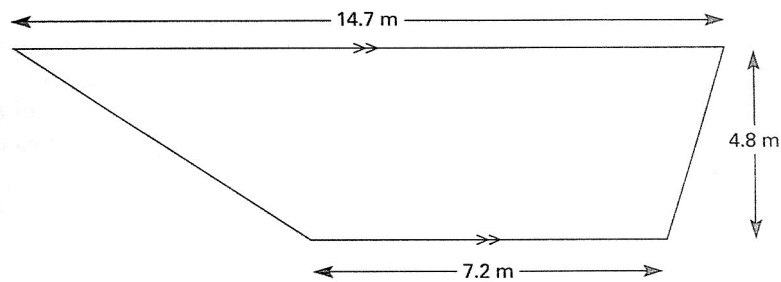


Figure 6

Polygons

A Polygon is a plane figure which has more than four straight sides. A list of the common polygons is given in the table below:

Table 1. Polygons

Pentagon 5 sides	Heptagon 7 sides	Nonagon 9 sides
Hexagon 6 sides	Octagon 8 sides	Decagon 10 sides
Undecagon 11 sides	Dodecagon 12 sides	

To determine the exterior angle of any regular polygon, divide 360° by the number of sides the polygon has.

Example:

$$\text{Exterior angle Pentagon } \frac{360^\circ}{5} = 72^\circ$$

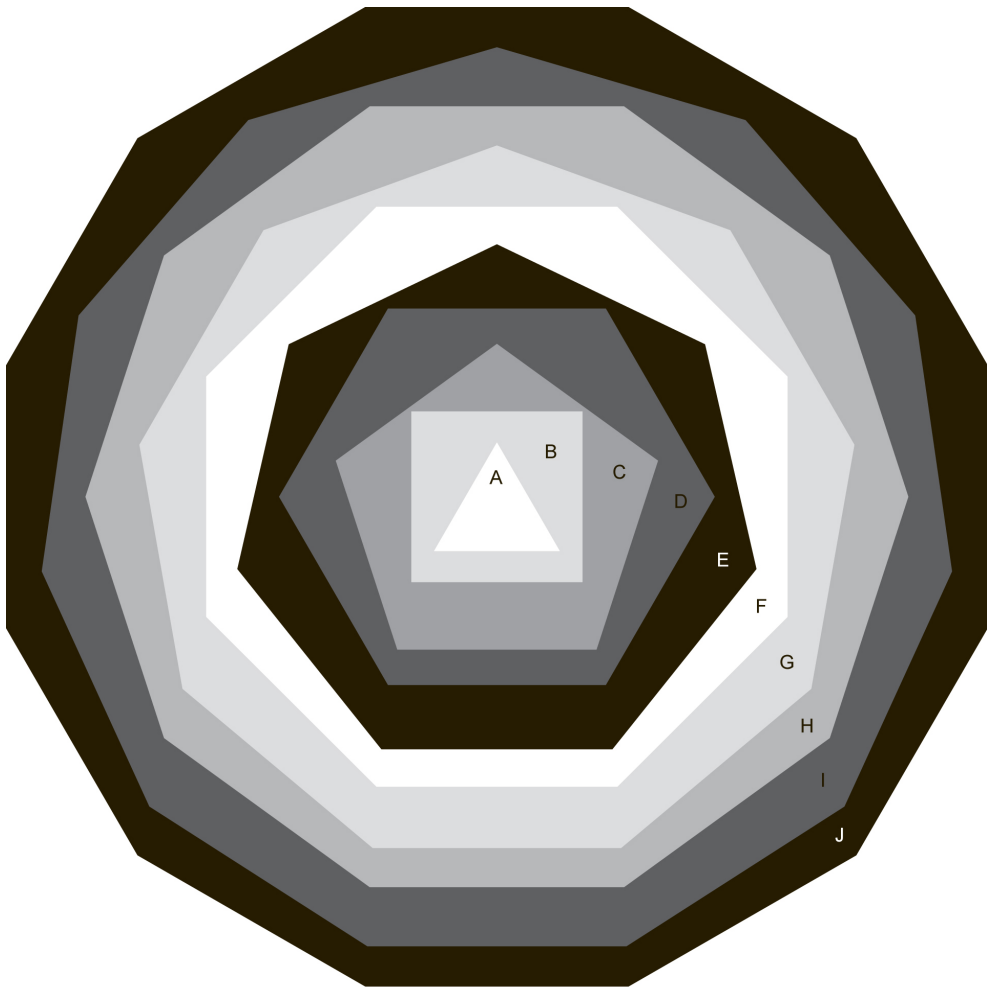
$$\text{Interior angle} = 108^\circ$$

Example:

$$\text{Exterior angle of Hexagon } \frac{360^\circ}{6} = 60^\circ$$

$$\text{Interior angle} = 120^\circ$$

This calculation enables us to draw polygons with set squares or a protractor.



- | | | | | |
|------------|-----------|------------|-------------|-------------|
| A Triangle | B Square | C Pentagon | D Hexagon | E Heptagon |
| F Octagon | G Nonagon | H Decagon | I Undecagon | J Dodecagon |

Figure 7

1.2 Perimeters and Areas of Quadrilaterals

Complete the exercises in section 1.1.

2.0 Estimate and Calculate Job Costs

Key Learning Points

- Estimation and calculation of total job costs (labour and materials)

2.1 Estimation and Calculation of Total Job Costs

Pricing - Labour Only

We can now consider the two types of priced work, labour only and labour and materials.

Labour only is the easiest to work out; for once the area of work is established it has only to be multiplied by your required sum per m². One plasterer may be happy working for €12.00 per square metre, while another may consider his work is worth €16.00 per square metre. Again the figure may be related to the amount of work and the site conditions.

Assuming you are charging €12.00 per m² for 100m² of plastering, the labour only cost will be €1200.00.

Pricing - Labour Plus Materials

Should you also be required to supply materials, you will first of all need to find out the cost of the materials. Let us assume that you are applying Skim coat to 100m² of plasterboard, as in the earlier example. We know that 24 bags will need to be purchased.

For the sake of this exercise we will say that the plaster will cost €9.30 per bag, 24 bags at 9.30 will cost €223.20. This figure will give an approximate material cost of €2.23 per metre. Therefore we have labour only at €12.00 per m² and Labour and materials at €14.23 per m². After a time, and if material prices remain stable, you will find that you will be able to compile a list of appropriate prices for different types of work.

You must appreciate that the figures given above are only examples, and are not intended to indicate current prices either for labour or materials.

Numbered Items

These are normally considered, or allowed for, on domestic developments. On large contracts, where a Bill of Quantities has been prepared, they will be listed.

Bill of Quantities

A Bill of Quantities is a List of all work to be done, and a section is compiled for each trade. The types of work likely to have a Bill of Quantities include shops and industrial development. Things that will be listed as numbered items include: Pipes, Heating ducts and Electrical installations. In the case of 25mm pipes, the item should be written as;

Labour to 25mm pipes - 15 no.

In other words you will have to plaster around fifteen 25 mm pipes. Once you have learnt how to calculate areas of work, you will have the basic requirement for calculating the amount of materials needed and their costs.

S O L A S

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