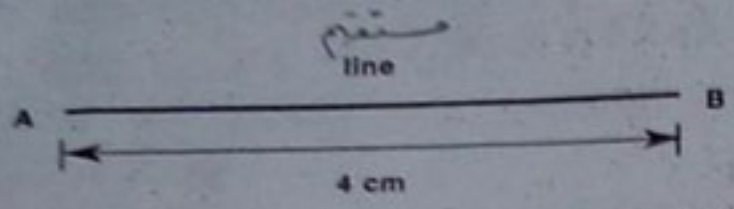
Unit 4

Surfaces and angles

Section 1: Vocabulary



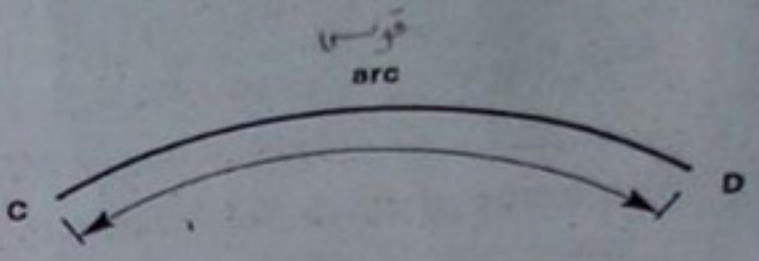


Figure 1: One-dimensional (1D) shapes

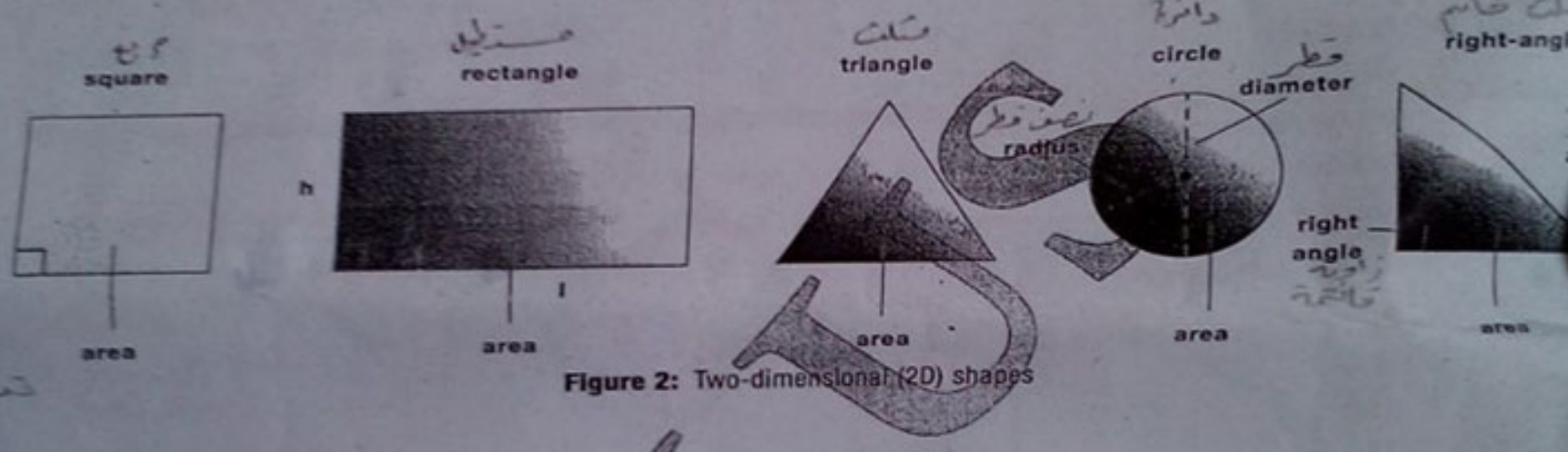


Figure 2: Two-dimensional (2D) shapes

A Read the text and look at the diagrams.

A line has only one **dimension**: **length** (l). For example, in Figure 1 the line from point A to point B has a length of 4 centimetres (cm). An **arc** is also a **one-dimensional** shape. It is a curved line between two points.

Some shapes have two dimensions: length and **height** (h). **Squares**, **rectangles**, **triangles** and **circles** are **two-dimensional** shapes. The length around most shapes is called the **perimeter** but the length around a circle is called the **circumference**. The **width** (w) of a circle is the **diameter**. The length from the centre to the edge of the circle is called the **radius** (r).

The space between two connected lines is an **angle**. Squares and rectangles have four angles of 90 **degrees**. The sign for 'degrees' is a small ° above the line. Some triangles have a 90° angle. These are called **right-angled** triangles. The sign for a right angle in a triangle is a small square. The sign for any other angle is a curved line.

Two-dimensional shapes have **area**. The **formula** for the area of a rectangle is *length* × *height*. For example, a rectangle 4 cm × 3 cm has an area of 12 **square centimetres** (cm²). The formula for the area of a triangle is ½ × length (or **base**) × vertical height. For example, a triangle with base 4 cm and vertical height 3 cm has an area ½ × 4 × 3 = 6 cm².

The formula for the area of a circle is πr^2, where π, pronounced **pi**, is a constant – roughly 3.142. The area of a circle of radius 4 cm is $3.142 \times 4^2 = 50.272$ cm². We use π to calculate the length of the circumference too. The formula is $2\pi r$. So the circumference of the same circle of radius 4 cm is $2 \times 3.142 \times 4 = 25.136$ cm.

B Look at Figure 3. Answer the questions.

1 What is ABCD? square

2 What is BCD? triangle

3 How many circles are there? one

4 How many squares are there? one

5 How many rectangles are there? zero

6 How many right-angled triangles are there? two

7 How many other triangles are there? two

8 What size is angle AFB? 90°

9 What size is angle BFE? 45°

10 What is the curved line from A to B called? arc

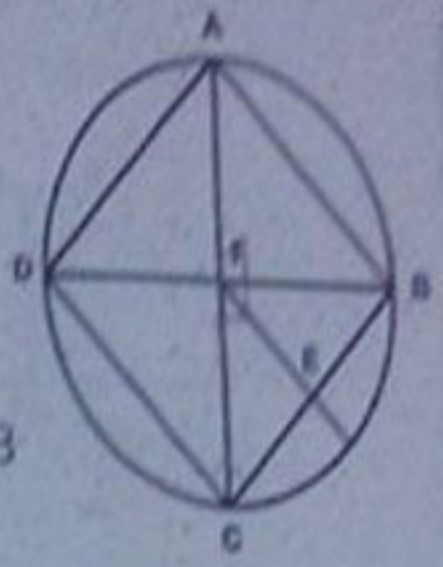


Figure 3

C Look at the five shapes in Figure 4.

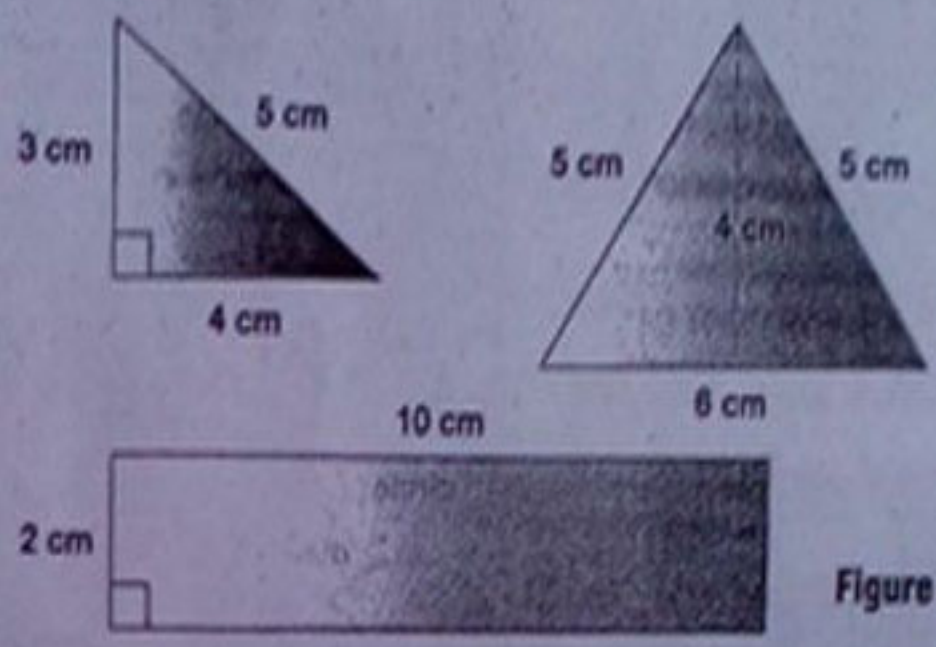


Figure 4

1 What is the correct area of each shape?

12 cm² 20 cm² 25 cm²

28.3 cm² 6 cm²

a The square is 25 cm²

b The rectangle is 20 cm²

c The right-angled triangle is 6 cm²

d The other triangle is 12 cm²

e The circle is 28.3 cm²

2 Calculate the perimeter or circumference of each shape.

18.9 cm 20 cm 12 cm 16 cm 24 cm

a The perimeter of the right-angled triangle is 12 cm

b The perimeter of the other triangle is 16 cm

c The perimeter of the rectangle is 24 cm

d The perimeter of the square is 20 cm.

e The circumference of the circle is 18.9.

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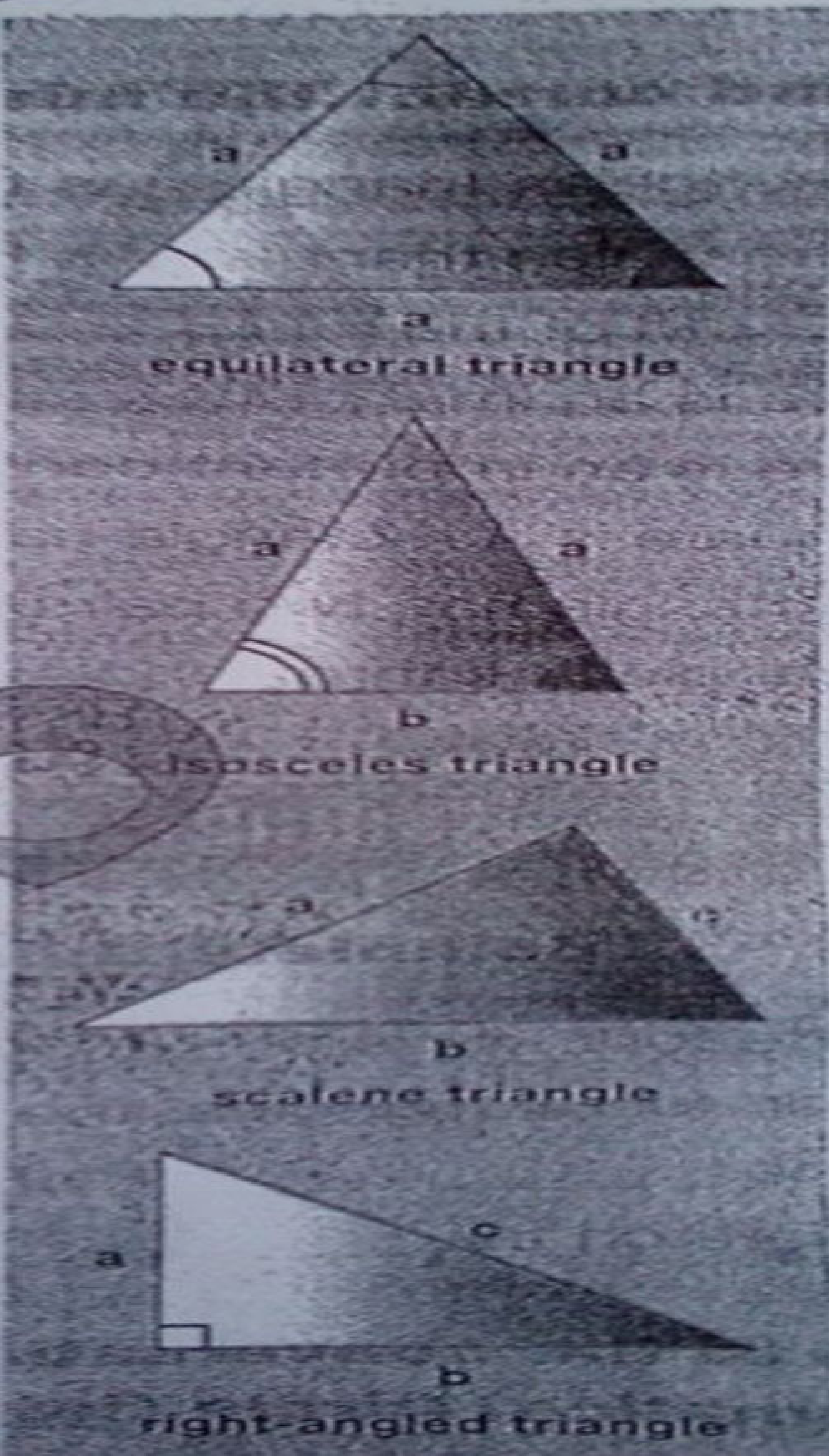
و أسمائهم



equilateral triangle

isosceles triangle

scalene triangle

right-angled triangle

C Find and correct the mistake in each sentence.

1 An isosceles triangle has two sides are equal.

2 An isosceles triangle has two angles which is equal.

3 One kind of triangle is the scalene triangle who has no equal sides or angles.

4 There is an important theorem in trigonometry which named after a Greek mathematician.

5 There is an important constant in geometry which it is called pi.

6 A square is a rectangle has four equal sides and four right angles.

7 A rectangle has two pairs of lines which they are parallel.

8 A triangle has three angles which adds up to 180°.