Worksheet Pack – Sector and Segment of a Circle

Worksheet 1 – Length of Arc and Area of Sector
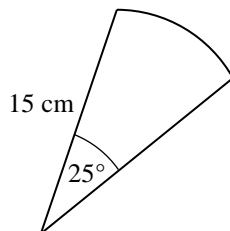
Length of arc

Sector of a circle

x

r

length of arc = $\dfrac{x}{360} \times 2\pi r$
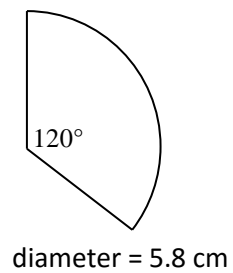
area of sector = $\dfrac{x}{360} \times \pi r^2$

For each of the following sectors, calculate:
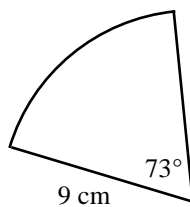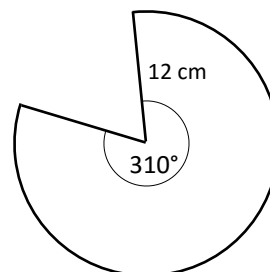
(i) the length of arc;   (ii) the area of sector.

(a)

15 cm

25°

(b)
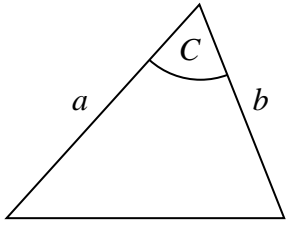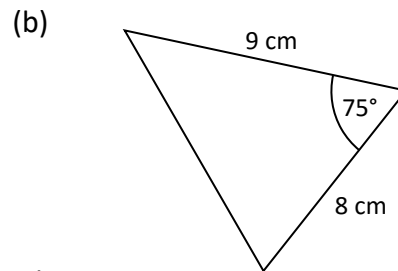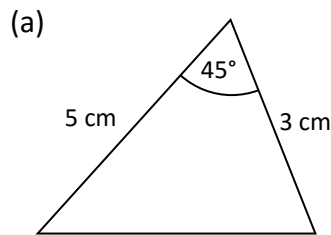
120°

diameter = 5.8 cm

(c)

73°

9 cm

(d)

12 cm

310°

Worksheet 2 – Finding the area of Triangle using $A = \frac{1}{2}ab$ Sin C
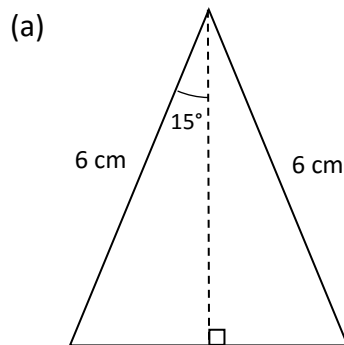
area of triangle = $\frac{1}{2}ab$ Sin C

1. Work out the area of the following triangles:

(a)

45°

5 cm   3 cm

(b)

9 cm

75°

8 cm

2. Work out the area of the following isosceles triangles:

(a)

15°

6 cm   6 cm

(b)

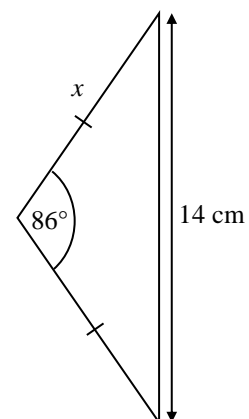40°

5 cm   5 cm
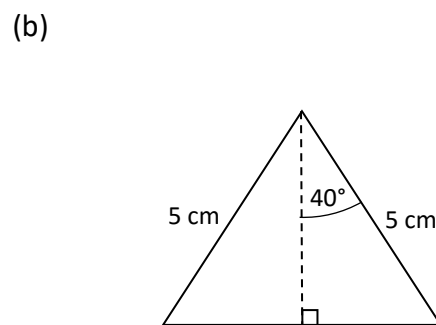
3.   For the following triangle:
   (a)   Work out the size of angle a.
   (b)   Calculate the area of the triangle.
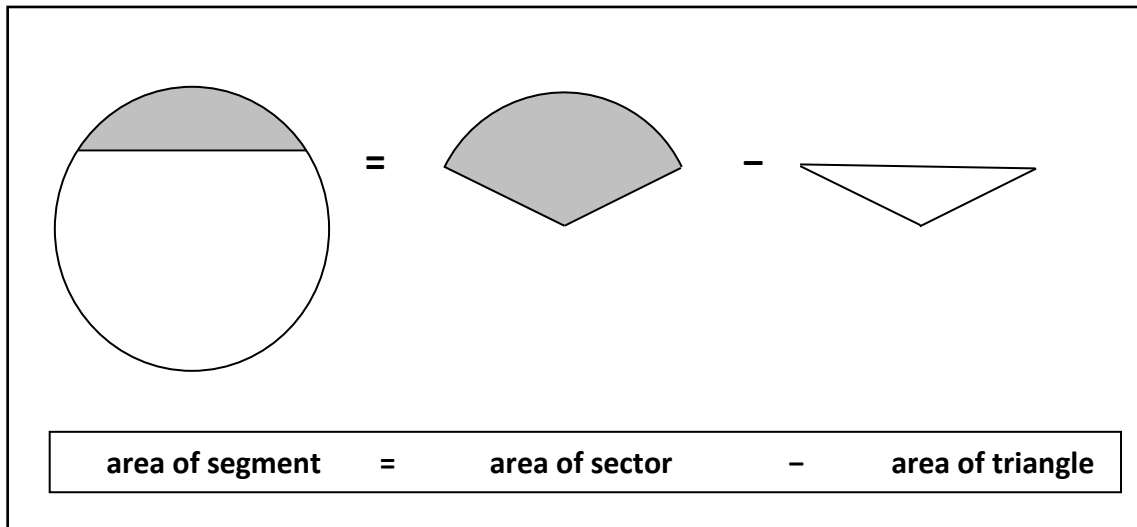

a

20 cm   20 cm

16 cm
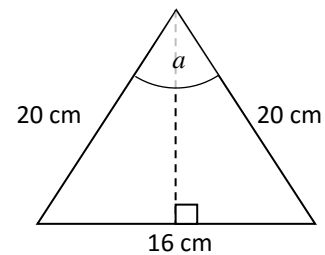
4.   For the following isosceles triangle:
   (a)   Work out x, the length of one side of the triangle.
   (b)   Calculate the area of the triangle.

x

86°

14 cm

Worksheet 3 – Area of a Segment

A segment of a circle is part of a circle cut off by a chord.

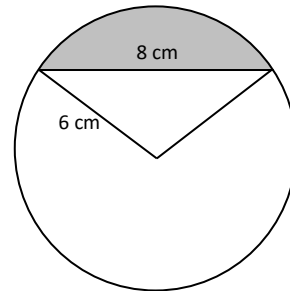| area of segment | = | area of sector | – | area of triangle |

1. Calculate the area of each of the shaded segments:
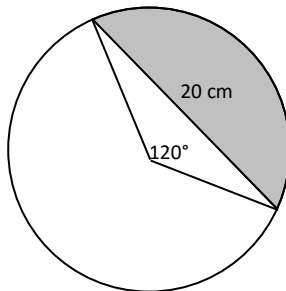
(a)

5 cm   36°   5 cm
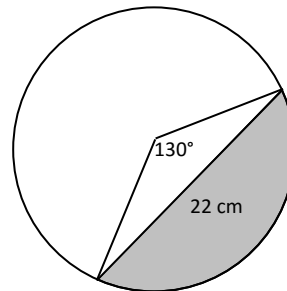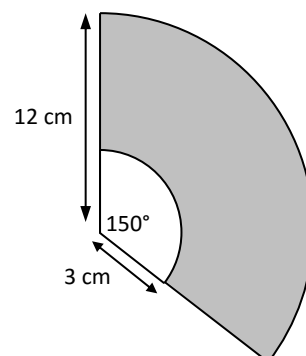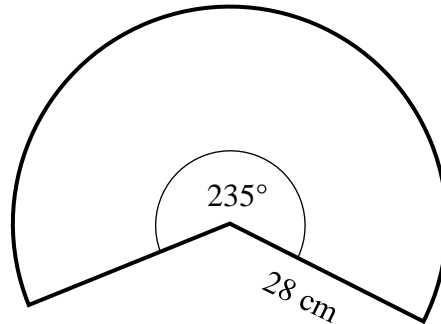
(b)

8 cm

6 cm

(c)

20 cm

120°

(d)

130°

22 cm
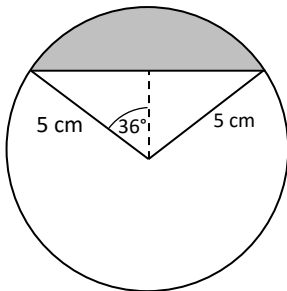
2.   Calculate the area of the shaded part.
   Give your answer correct to 1 d.p.

12 cm

150°

3 cm

Worksheet 4 – Area of a Composite Shapes

1. From a piece of cardboard Alan cuts out a sector of radius 28 cm, as shown in the diagram below.

(a) Work out the area of cardboard that he cuts.

(b) The curved surface area of a cone is given by A = πrl.
     Make r the subject of this formula.

(c) Alan uses the sector above to form a cone, without overlapping any cardboard.
     Work out the radius of the base of the cone, giving your answer correct to 1 decimal place.

2. This diagram shows the cross-section ABCD of a tent where AD represents the ground. BC is an arc with centre O and radii OB and OC. O lies on the line AD. AB = BO = OC = CD = 3 metres.
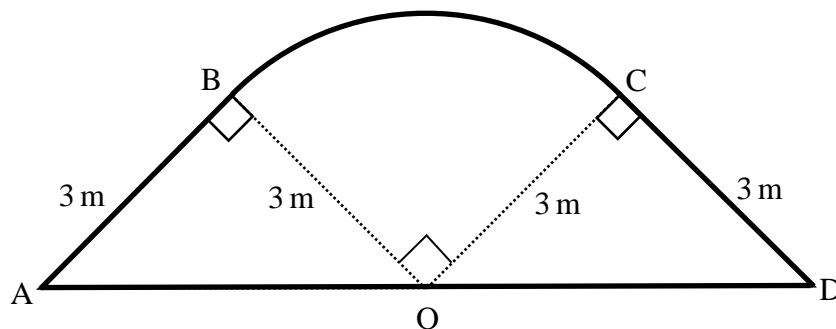
(a) Work out the length of arc BC.

(b) Work out the length of side AO.

(c) A piece of wire goes all round the cross-section ABCD and through the line DOA. Show that the length of wire used is approximately 19 metres.

3. This is a symmetrical design of a crab. It consists of two identical sectors, a trapezium and several identical rectangles. The sectors are of radius 6 cm and their angle at the centre is 240°. Each rectangle is 10 cm long and 1.7 cm wide.
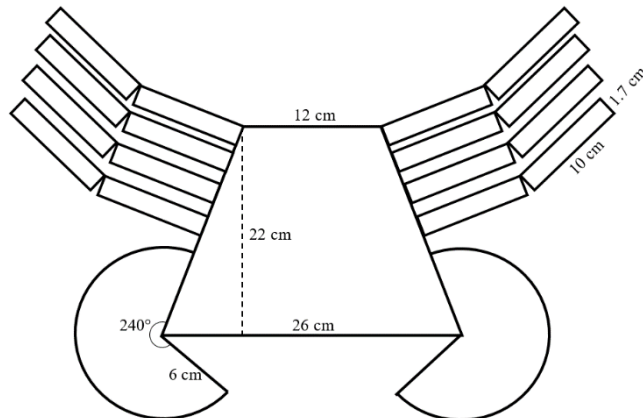
(a) Calculate the area of one of the sectors, correct to 1 decimal place.

(b) Calculate the area of the trapezium.

(c) Calculate the total area of the crab.

4. The diagram shows the top view of a circular pool. The shaded area is a step inside the pool. The radius OA = 2.5 m, OC = 1.5 m and AB = 4 m.
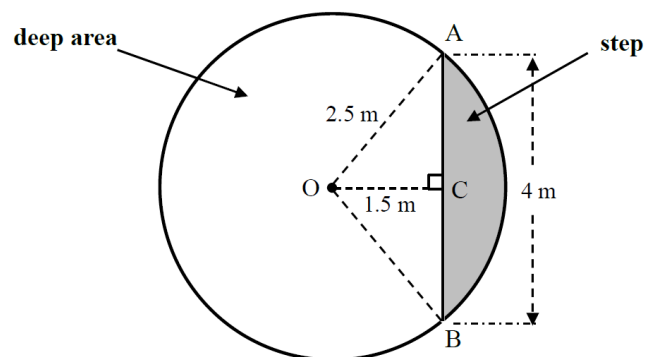
(a) Calculate angle AOB , giving your answer correct to 1 decimal place.

(b) Calculate the area of the step. Give your answer correct to 4 significant figures.

(c) Calculate the area of the pool where it is deep (i.e. the unshaded area). Give your answer correct to 4 significant figures.

(d) The pool is filled with water, such that the deeper part is 0.4 m deep. The step is 0.2 m below the surface of the water. Calculate the volume of water needed to fill the pool. Give your answer correct to the nearest litre.