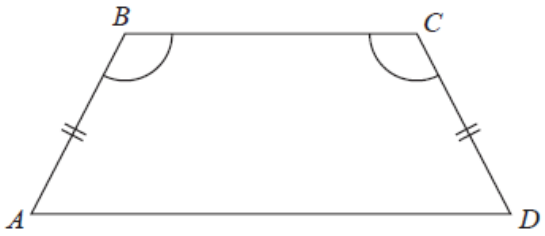
Mixed Exercise - 3

1.

ABCD is a quadrilateral.

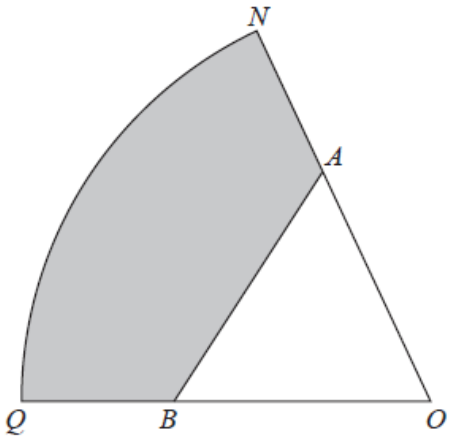


$AB = CD$.
Angle ABC = angle BCD.

Prove that $AC = BD$.

(4 marks)

2.



ONQ is a sector of a circle with centre *O* and radius 11 cm.

A is the point on *ON* and *B* is the point on *OQ* such that *AOB* is an equilateral triangle of side 7 cm.

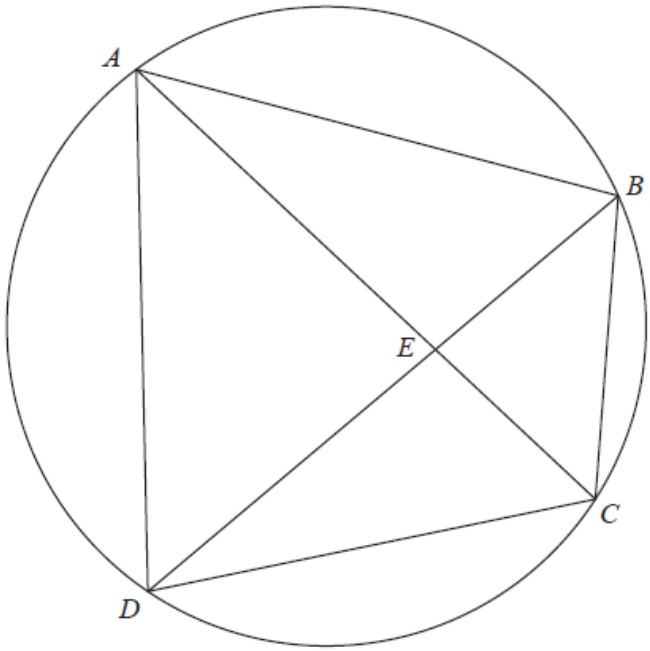
Calculate the area of the shaded region as a percentage of the area of the sector *ONQ*.
Give your answer correct to 1 decimal place.

..... %

(5 marks)

3.

A, *B*, *C* and *D* are four points on the circumference of a circle.

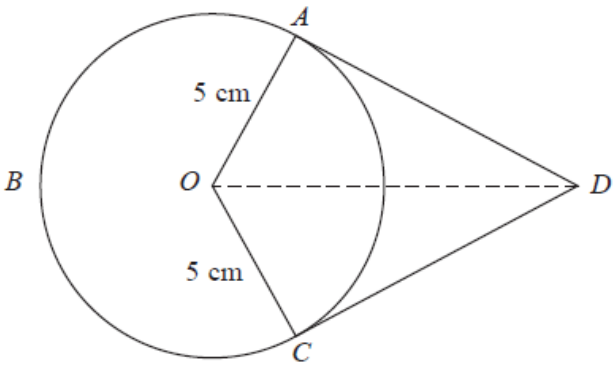


AEC and *BED* are straight lines.

Prove that triangle *ABE* and triangle *DCE* are similar.
You must give reasons for each stage of your working.

(3 marks)

4.



A, *B* and *C* are points on a circle of radius 5 cm, centre *O*.
DA and *DC* are tangents to the circle.
DO = 9 cm

Work out the length of arc *ABC*.
Give your answer correct to 3 significant figures.

..... cm

(5 marks)

5.

Here is a rectangle and a right-angled triangle.

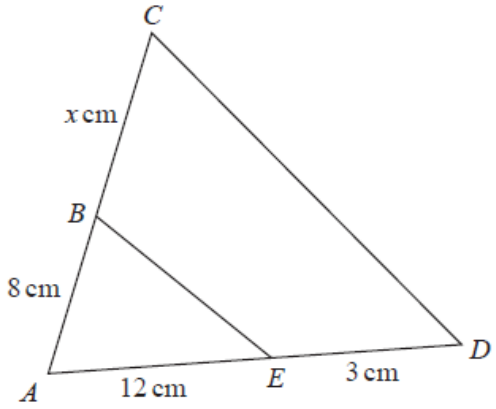
All measurements are in centimetres.
The area of the rectangle is greater than the area of the triangle.

Find the set of possible values of x.

(5 marks)

6.

The two triangles in the diagram are similar.



There are two possible values of x.

Work out each of these values.
State any assumptions you make in your working.

(5 marks)