1   Here are a circle and a sector of the circle.

They each have radius r.

Not drawn
accurately
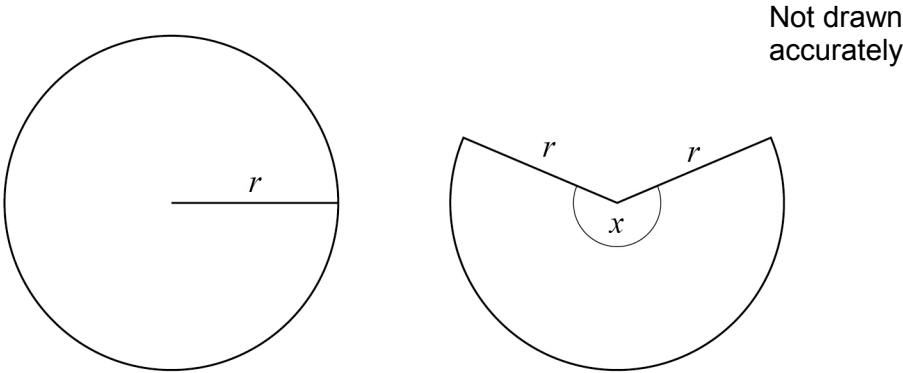
circumference of circle = perimeter of sector

Work out the size of angle x.

Give your answer in terms of π
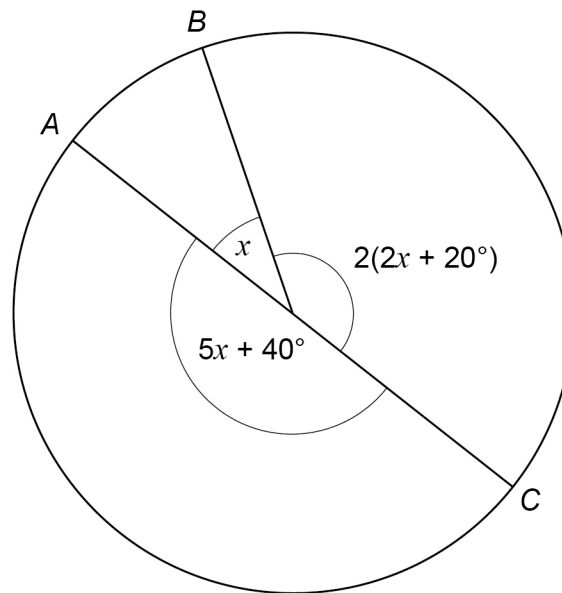
[4 marks]

Answer _____ degrees

2   *A*, *B* and *C* are three points on a circle.

The radii from *A*, *B* and *C* are shown.

Not drawn
accurately

Is *AC* a diameter of the circle?

You **must** show your working.

[3 marks]

3   The equation of a circle is $x^2 + y^2 = 11$

Work out the length of the **diameter**.

Circle your answer.

[1 mark]

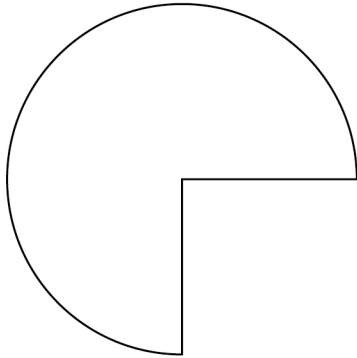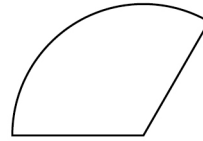$\sqrt{11}$ $2\sqrt{11}$ $\sqrt{22}$ 22

4   Here are two shapes, P and Q.

P

$\frac{3}{4}$ of a circle, radius 20 cm

Q

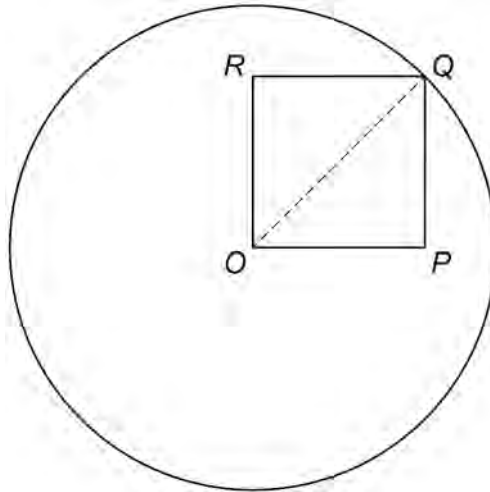$\frac{1}{3}$ of a circle, radius 15 cm

Not drawn
accurately

How many times bigger is the area of P than the area of Q?

You **must** show your working.

[4 marks]

_____

_____

_____

_____

_____

_____

_____

_____

Answer _____

5 A circle, centre *O*, has circumference 20π cm

Q is a point on the circle.

OPQR is a **square**.

Not drawn
accurately

perimeter of the square : circumference of the circle $= \sqrt{a} : \pi$ where *a* is an integer.
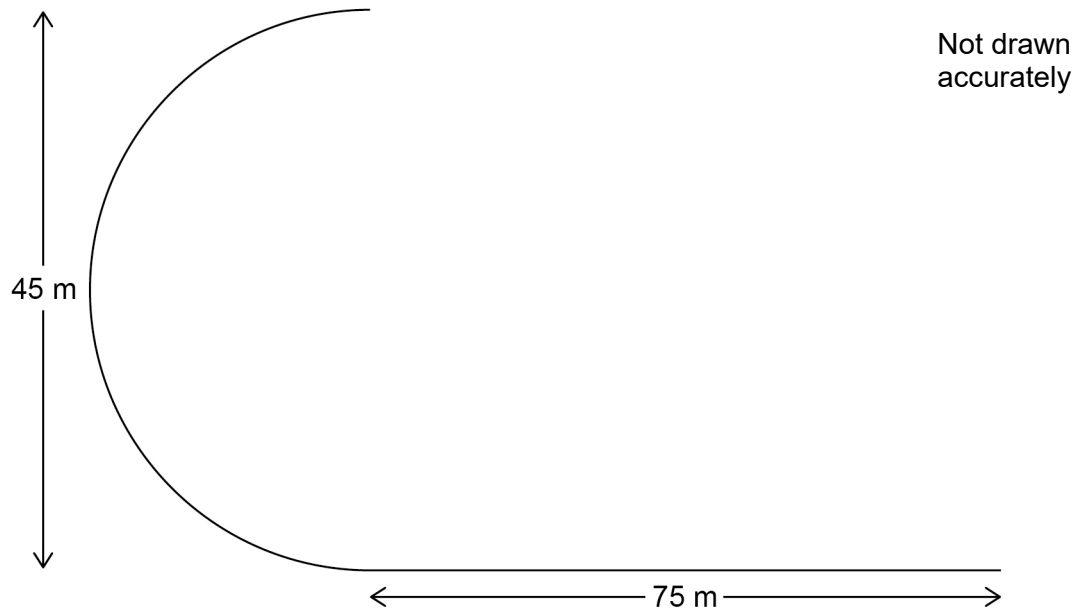
Work out the value of *a*.

You **must** show your working.

[4 marks

$a =$ _____

6   Part of a running track is the arc of a semicircle joined to a straight line.

The semicircle has diameter 45 metres.

The straight line has length 75 metres.

Not drawn
accurately

45 m

75 m

Abby runs once along this part of the track in 18 seconds.

Work out her average speed.

Give your answer to 2 significant figures.

[4 marks]

Answer _____ m/s