

Name: _____

Exam Style Questions

Equation of a Circle



Corbettmaths

Ensure you have: Pencil, pen, ruler, protractor, pair of compasses and eraser

You may use tracing paper if needed

Guidance

1. Read each question carefully before you begin answering it.
2. Don't spend too long on one question.
3. Attempt every question.
4. Check your answers seem right.
5. Always show your workings

Revision for this topic

www.corbettmaths.com/contents

Video 12



1. The equation of a circle C, with centre O, is:

$$x^2 + y^2 = 225$$

- (a) Find the coordinates of the centre O.

$$(\text{.....}^0, \text{.....}^0)$$

(1)

- (b) Find the radius of C.

$$\text{.....}^{15}$$

(1)

$$x = 9 \text{ and } y = 12$$

- (c) Show the point (9, 12) lies on C.

$$\begin{aligned} 9^2 + 12^2 &= 225 & \text{therefor (9,12) lies} \\ 81 + 144 &= 225 & \text{on C} \\ 225 &= 225 \end{aligned}$$

(2)

-
2. A circle has centre (0, 0) and radius 6.

- (a) Write down the equation of the circle.

$$\text{.....}^{x^2 + y^2 = 36}$$

(2)

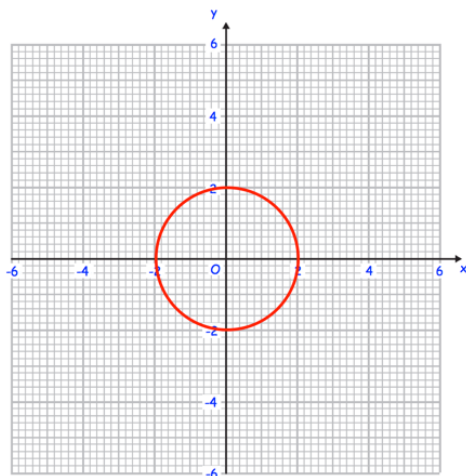
- (b) Does the point (−3 , 5) lie on the circle?

$$\begin{aligned} x^2 + y^2 &= 36 \\ (-3)^2 + 5^2 & \\ 9 + 25 & \\ 34 &\neq 36 \end{aligned}$$

$$\text{.....}^{\text{No}}$$

(2)

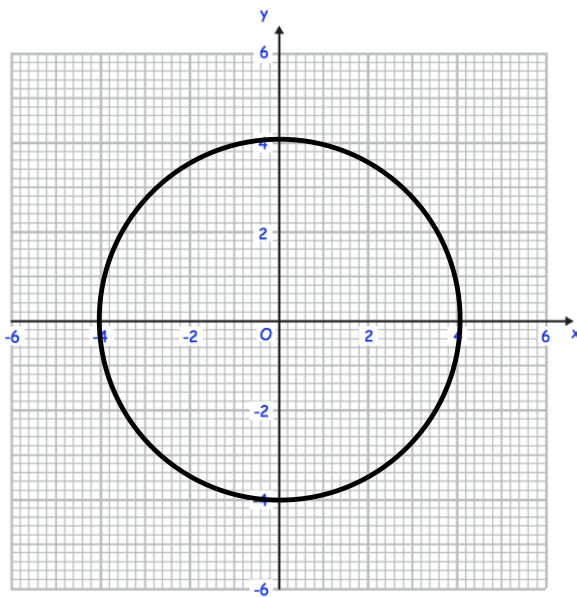
3. Find the equation of the circle.



$$x^2 + y^2 = 4$$

.....
(2)

4. Draw the circle with equation $x^2 + y^2 = 16$



(2)

5. A circle C has centre O

The points A (0, 7) and B (0, -7) lie on the diameter of C.

- (a) Find the coordinates of the centre O.

$$(\text{.....}0\text{.....}, \text{.....}0\text{.....})$$

(1)

- (b) Write down the equation of the circle.

$$x^2 + y^2 = 49$$

.....

(2)

-
6. AB is a diameter of a circle C.
O is the centre of the circle
A has coordinates (-4, 3) and B has coordinates (4, -3).

- (a) Find the centre of the circle, O.

$$(\text{.....}0\text{.....}, \text{.....}0\text{.....})$$

(1)

- (b) Find the equation of C

$$r = 5$$
$$x^2 + y^2 = 25$$

.....

(2)

- (c) Show the point D, (-3, -4) lies on C.

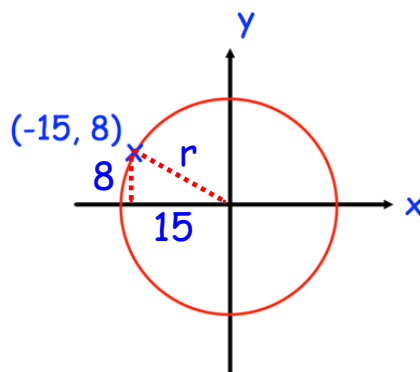
$$\begin{aligned}(-3)^2 + (-4)^2 &= 25 \\ 9 + 16 &= 25 \\ 25 &= 25\end{aligned}$$

$(-3, -4)$ is a point
on C

(2)

7. The circle below has centre $(0, 0)$.
The point $(-15, 8)$ is a point on the circle.

Find the equation of the circle.



$$15^2 + 8^2 = r^2$$

$$225 + 64 = r^2$$

$$289 = r^2$$

$$r = 17$$

$$x^2 + y^2 = 289$$

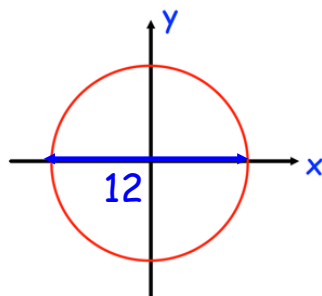
.....
(3)

8. The circle shown has $x^2 + y^2 = 36$

Find the circumference of the circle.

Give your answer in terms of π

$$r = 6$$



$$C = \pi \times D$$

$$C = 12\pi$$

.....
(3)

9. A circle has the equation $x^2 + y^2 = 121$

Find the area of the circle.
Give your answer in terms of π

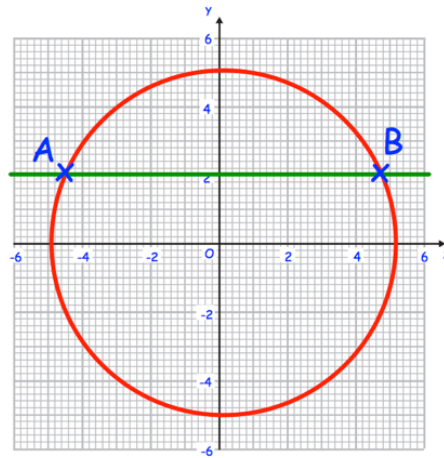
$$r = 11$$

$$\begin{aligned} A &= \pi \times r^2 \\ &= \pi \times 121 \end{aligned}$$

$$121\pi$$

.....
(3)

10. A circle has equation $x^2 + y^2 = 25$
A straight line meets the circle at the points A and B.



- (a) Write down the equation of the straight line.

$$y = 2$$

.....
(1)

- (b) Find the coordinates of the points A and B.
Give your answers in surd form.

$$x^2 + 2^2 = 25$$

$$x^2 + 4 = 25$$

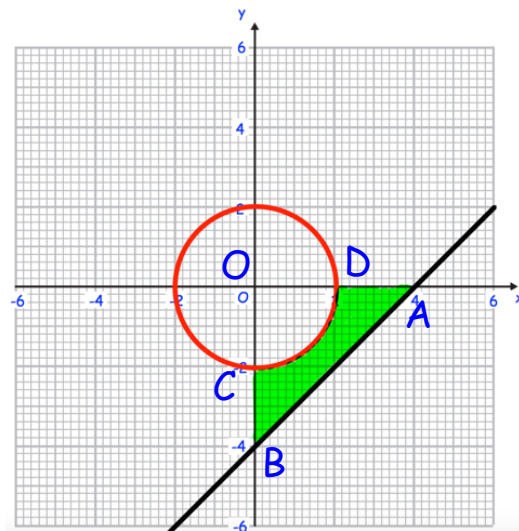
$$x^2 = 21$$

$$x = \pm \sqrt{21}$$

$$A = (-\sqrt{21}, 2) \text{ and } B = (\sqrt{21}, 2)$$

.....
(4)

11. The circle below has equation $x^2 + y^2 = 4$
The line has equation $y = x - 4$



- (a) Find the area of the shaded region.

$$\begin{array}{ll} \text{Area of triangle OAB} & \text{Area of sector ODC} \\ = \frac{1}{2} (4) \times 4 = 8 & = \frac{1}{4} (\pi \times 2^2) \\ & = \pi \end{array}$$

$$8 - \pi \text{ or } 4.8584$$

.....
(4)

- (b) Find the perimeter of the shaded area.

$$\begin{array}{ll} AD = 2 & \text{Arc DC} = \frac{1}{4} (\pi \times 4) = \pi \\ BC = 2 & \text{Line AB} = \sqrt{32} \text{ or } 4\sqrt{2} \end{array}$$

$$\begin{array}{ll} 4^2 + 4^2 = AB^2 & 4 + \pi + 4\sqrt{2} \\ 16 + 16 = AB^2 & \text{or} \\ 32 = AB^2 & AB = \sqrt{32} \end{array}$$

$$12.798$$

.....
(4)