

Name: _____

Level 2 Further Maths



Equation of a Circle

Corbettmaths

Ensure you have: Pencil or pen

Guidance

1. Read each question carefully before you begin answering it.
2. Check your answers seem right.
3. Always show your workings

Revision for this topic

www.corbettmaths.com/more/further-maths/



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

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

(a) Find the coordinates of the centre O.

(..... ,)
(1)

(b) Find the radius of C.

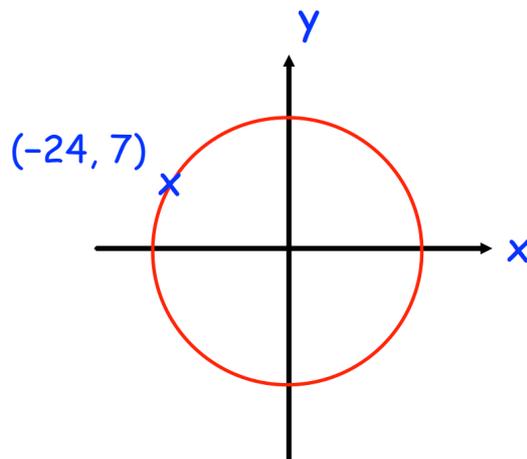
.....
(1)

(c) Show the point (8, 15) lies on C.

(2)

2. The circle below has centre $(0, 0)$.
The point $(-24, 7)$ is a point on the circle.

Find the equation of the circle.

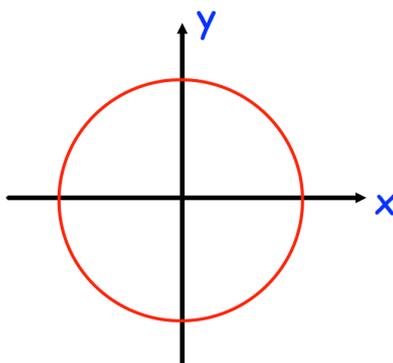


.....
(2)

3. The circle shown has $x^2 + y^2 = 42.25$

Find the circumference of the circle.

Give your answer in terms of π



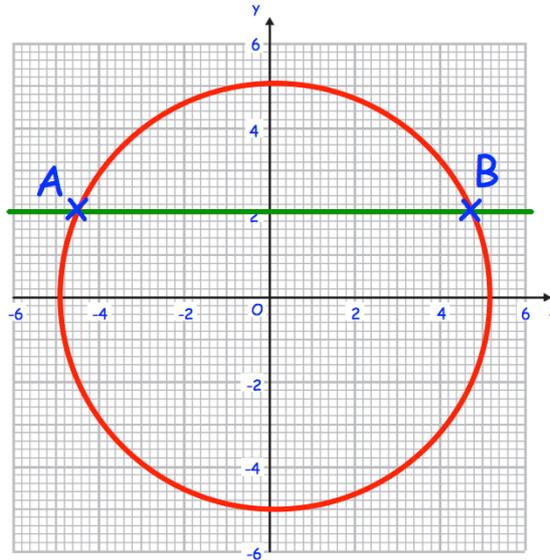
.....
(2)

4. A circle has the equation $x^2 + y^2 = 400$

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

.....
(2)

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



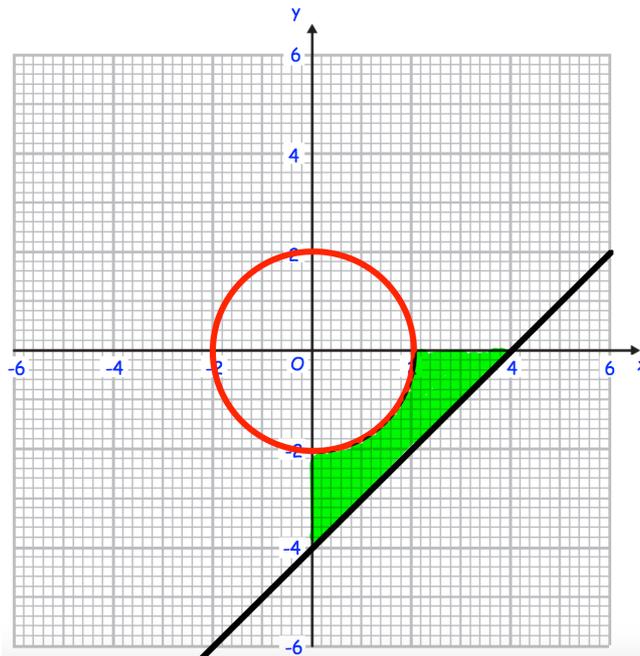
(a) Write down the equation of the straight line.

.....
(1)

(b) Find the distance AB

.....
(4)

6. 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.

.....
(4)

(b) Find the perimeter of the shaded region.

.....
(4)

7. The equation of a circle C, with centre A, is:

$$(x - 3)^2 + (y + 2)^2 = 25$$

(a) Find the coordinates of the centre A.

(..... ,)
(1)

(b) Find the radius of C.

.....
(1)

(c) Show the point (6, 2) lies on C.

(2)

8. A circle has centre (5, 2) and radius 4.

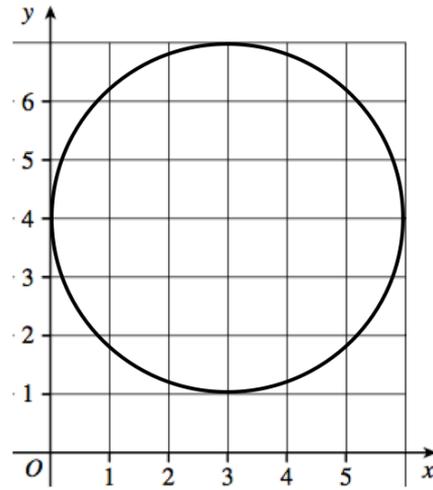
(a) Write down the equation of the circle.

.....
(2)

(b) Does the point (7, 4) lie on the circle?

.....
(2)

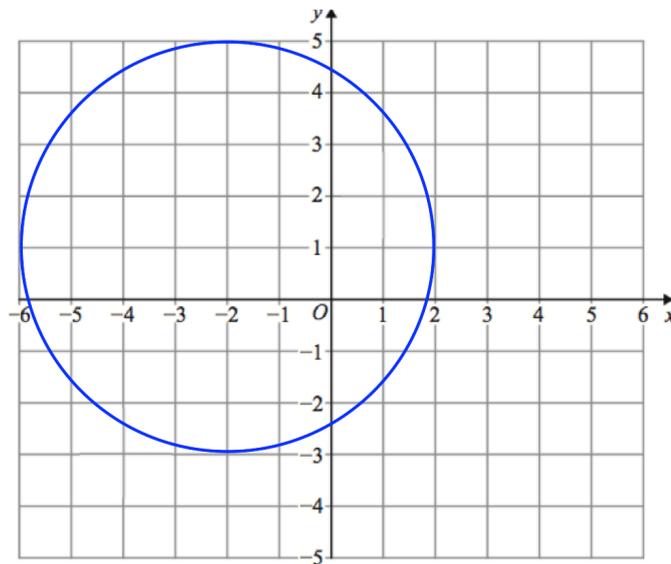
9.



Find the equation of the circle.

.....
(2)

10.



Find the equation of the circle.

.....
(2)

11. A circle C has centre P

The points A (0, 6) and B (8, 6) lie on the diameter of C.

(a) Find the coordinates of the centre P.

(..... ,)
(1)

(b) Write down the equation of the circle.

.....
(2)

12. AB is a diameter of a circle C.
Q is the centre of the circle
A has coordinates $(-2, 12)$ and B has coordinates $(8, 2)$.

(a) Find the centre of the circle, Q.

(.....,)
(1)

(b) Find the equation of C

.....
(2)

(c) Show the point D, $(10, 8)$ lies on C.

(2)

(d) Find the gradient of OD.

.....
(2)

(e) Find the equation of the tangent to C at the point D.

.....
(3)

13. A circle has equation $(x - 5)^2 + (y + 2)^2 = 20$

(a) Find the centre of the circle.

(..... ,)
(1)

(b) State, with a reason, whether this circle intersects the y-axis.

(2)

(c) Find the equation of a line parallel to $y = 2x$ that passes through the centre of the circle.

.....
(3)

(d) Show $y = 2x - 2$ is a tangent to the circle

(3)

(e) Find the coordinates of the point of contact.

.....
(2)

14. A circle has centre C and equation $x^2 + y^2 - 6x + 14y + 49 = 0$

(a) Find the centre of the circle.

(..... ,)
(2)

(b) Find the radius of the circle

.....
(2)

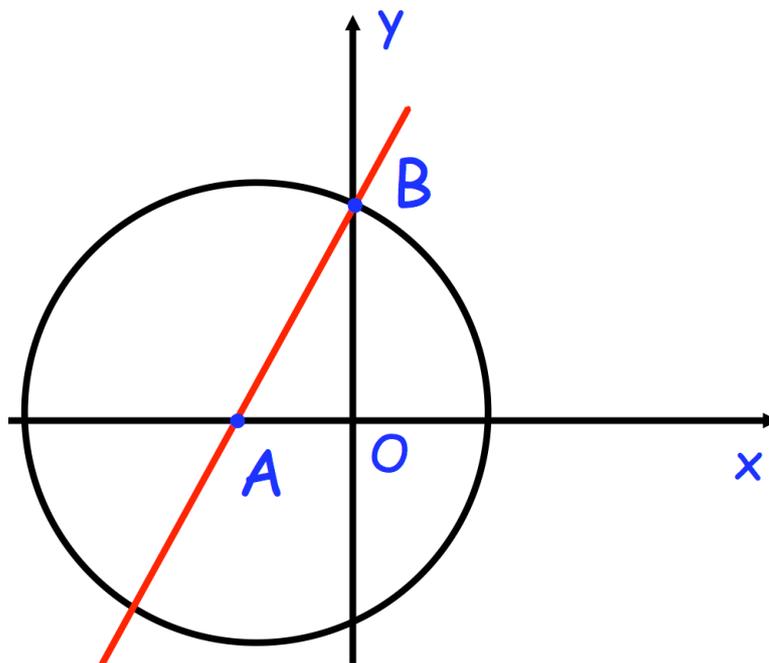
15. Circle 1 has an equation of $(x - 4)^2 + (y - 1)^2 = 36$

Circle 2 has an equation of $(x + 7)^2 + (y - 8)^2 = 100$

Calculate the distance between the centres of Circle 1 and Circle 2

.....
(4)

16. Shown below is the circle, centre A, with equation $(x + 9)^2 + y^2 = 225$



Find the equation of the line passing through A and B.

.....
(4)

17. The line $y = 2x - 1$ intersects the circle $(x - 2)^2 + (y + 5)^2 = 144$ at the points A and B.

Find the coordinates of A and B.

.....
(6)

18. A circle has equation $(x + 7)^2 + (y - 6)^2 = 49$

Is the point $(-4, 12)$ inside or outside the circle?
You must show your workings.

.....
(6)