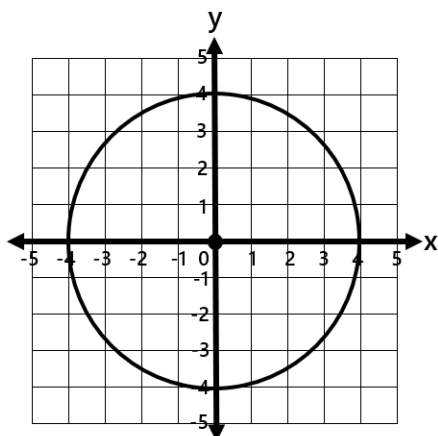


**Task 1 – For each of the following, state the centre and radius of the circle.**

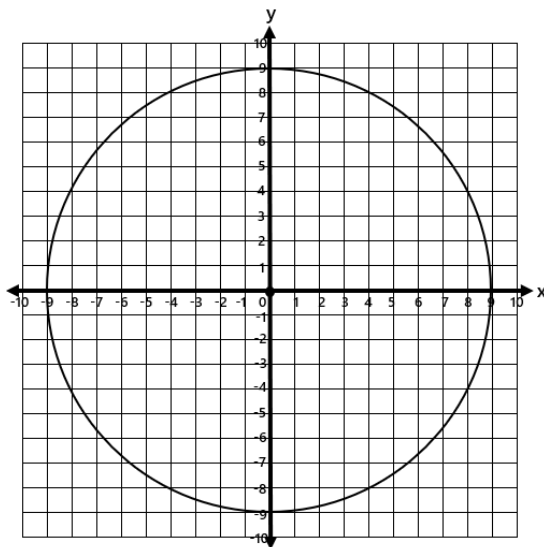
- 1)  $x^2 + y^2 = 25$
- 2)  $x^2 + y^2 = 49$
- 3)  $x^2 + y^2 = 16$
- 4)  $x^2 + y^2 = 100$
- 5)  $x^2 + y^2 = 9$
- 6)  $x^2 + y^2 = 64$
- 7)  $(x - 2)^2 + (y + 4)^2 = 36$
- 8)  $(x - 1)^2 + (y - 7)^2 = 121$

**Task 2**

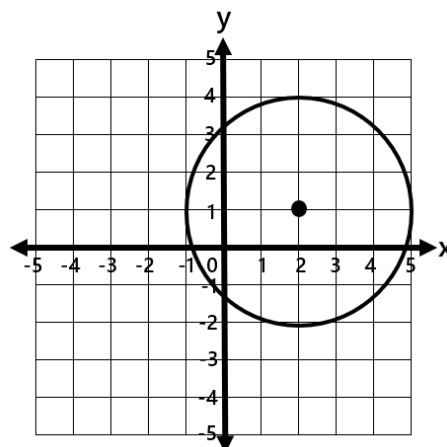
- 9) A circle is centred at  $(0, 0)$  and has a radius of  $\sqrt{3}$ . State the equation of the circle.
- 10) A circle is centred at  $(-8, -9)$  and has a radius of 9. State the equation of the circle.
- 11) A circle is centred at  $(3, 0)$  and has a radius of  $\sqrt{5}$ . State the equation of the circle.
- 12) A circle is centred at  $(0, 0)$  and has a radius of 4. State the equation of the circle.
- 13) Write down the equation of the circle pictured below.



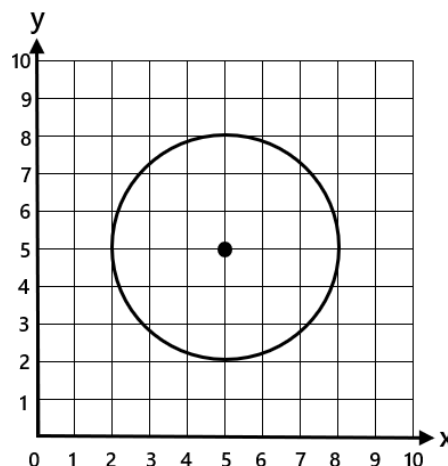
**14) Write down the equation of the circle pictured below.**



**15) Write down the equation of the circle pictured below.**



**16) Write down the equation of the circle pictured below.**



### Task 3

- 17) Does the point (4, 5) lie on the circle with equation  $x^2 + y^2 = 41$ ?
- 18) Does the point (1, 2) lie on the circle with equation  $x^2 + y^2 = 5$ ?
- 19) Does the point (0, 6) lie on the circle with equation  $x^2 + y^2 = 40$ ?
- 20) Does the point (3, 3) lie on the circle with equation  $(x - 1)^2 + (y + 2)^2 = 30$ ?
- 21) Does the point (-5, -2) lie on the circle with equation  $(x + 3)^2 + (y - 4)^2 = 40$ ?

### Task 4

- 22) P is the point (3, 4) on the circle with equation  $x^2 + y^2 = 25$ .  
Work out the equation of the tangent to the circle at the point P.
- 23) Q is the point (2, 3) on the circle with equation  $x^2 + y^2 = 13$ .  
Work out the equation of the tangent to the circle at the point Q.
- 24) M is the point (1, 2) on the circle with equation  $x^2 + y^2 = 5$ .  
Work out the equation of the tangent to the circle at the point M.
- 25) M is the point (-4, 1) on the circle with equation  $x^2 + y^2 = 17$ .  
Work out the equation of the tangent to the circle at the point M.
- 26) P is the point (-2, -4) on the circle with equation  $x^2 + y^2 = 20$ .  
Work out the equation of the tangent to the circle at the point P.
- 27) N is the point (-1, 3) on the circle with equation  $x^2 + y^2 = 10$ .  
Work out the equation of the tangent to the circle at the point N.

28) Work out the equation of the tangent to the circle  $(x + 1)^2 + (y - 2)^2 = 52$  at the point (5, -2).

29) Work out the equation of the tangent to the circle  $(x - 2)^2 + (y - 3)^2 = 13$  at the point (4, 6).

### Challenge

30) A circle has equation:

$$(x - 1)^2 + (y - 5)^2 = 89$$

A point P (9, 10) lies on the circumference of the circle.

Work out the coordinates of the point where the tangent meets the x-axis.

31) Circle A has equation:

$$x^2 + y^2 = 17$$

Circle B has equation:

$$(x - 4)^2 + (y - 1)^2 = 8$$

The tangent to Circle A is drawn at the point (1, 4).

The tangent to Circle B is drawn at the point (6, 3).

Find the coordinates of the point where the two tangents intersect.

32) A circle has the equation:

$$(x - 1)^2 + (y - 2)^2 = 8$$

A tangent is drawn at the point (3, 4).

The tangent intersects both the x-axis and y-axis.

Find the area of the triangle formed between the tangent, the x-axis and the y-axis.