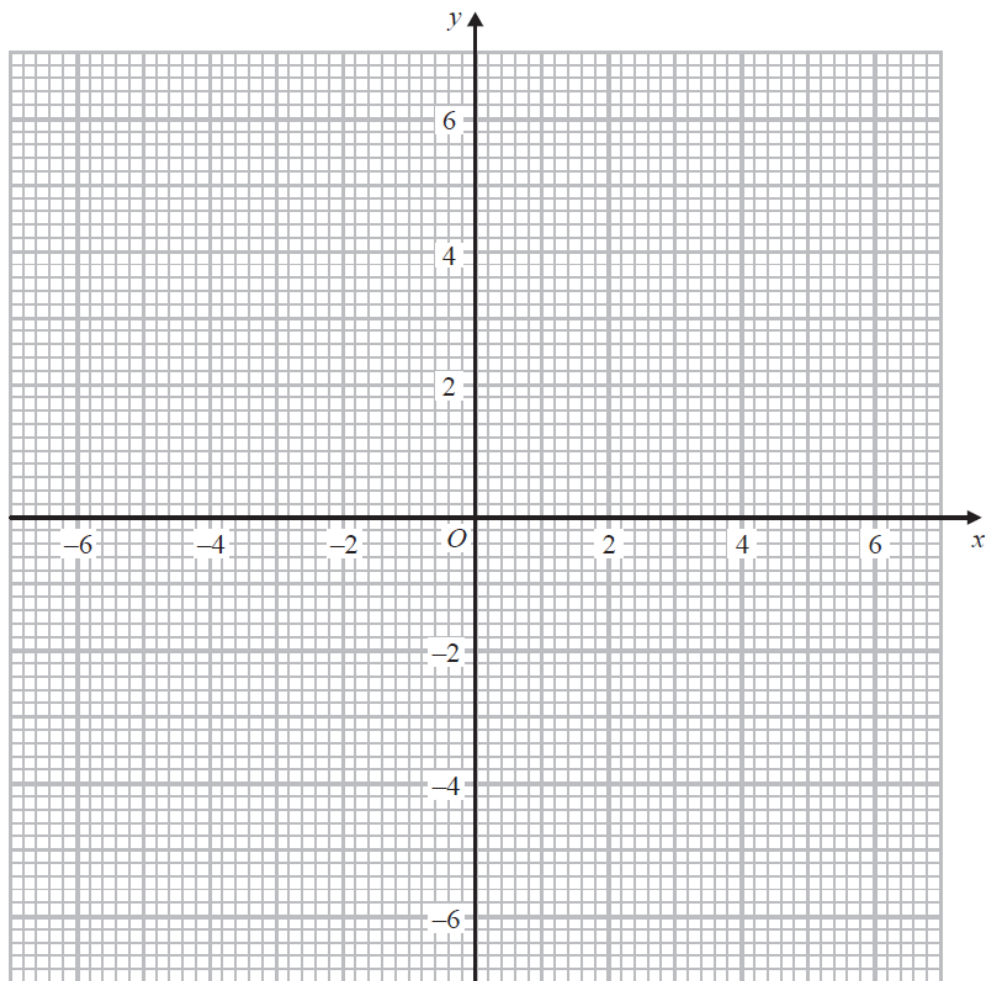


- 1 Prove algebraically that the straight line with equation $x - 2y = 10$ is a tangent to the circle with equation $x^2 + y^2 = 20$

(Total for Question is 5 marks)

- 2 (a) On the grid, draw the graph of $x^2 + y^2 = 12.25$



(2)

- (b) Hence find estimates for the solutions of the simultaneous equations

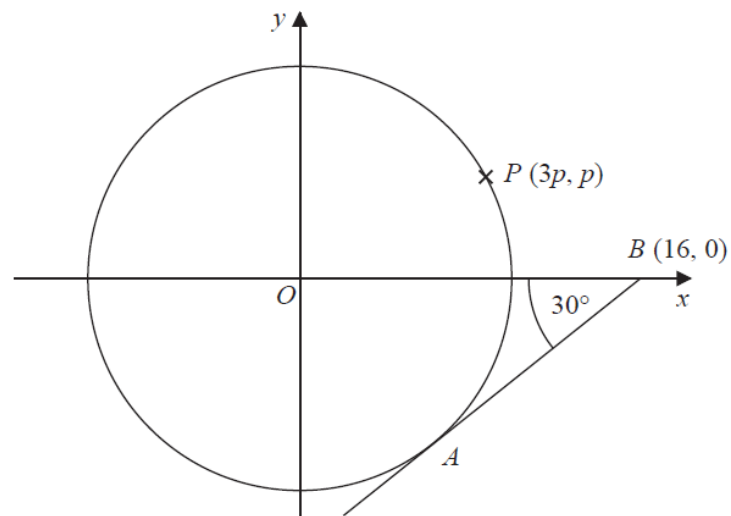
$$x^2 + y^2 = 12.25$$

$$2x + y = 1$$

(3)

(Total for Question is 5 marks)

- 3 The diagram shows a circle, centre O .



AB is the tangent to the circle at the point A .
Angle $OBA = 30^\circ$

Point B has coordinates $(16, 0)$
Point P has coordinates $(3p, p)$

Find the value of p .
Give your answer correct to 1 decimal place.
You must show all your working.

$p = \dots\dots\dots$

(Total for Question is 4 marks)

4 C is a circle with centre the origin.

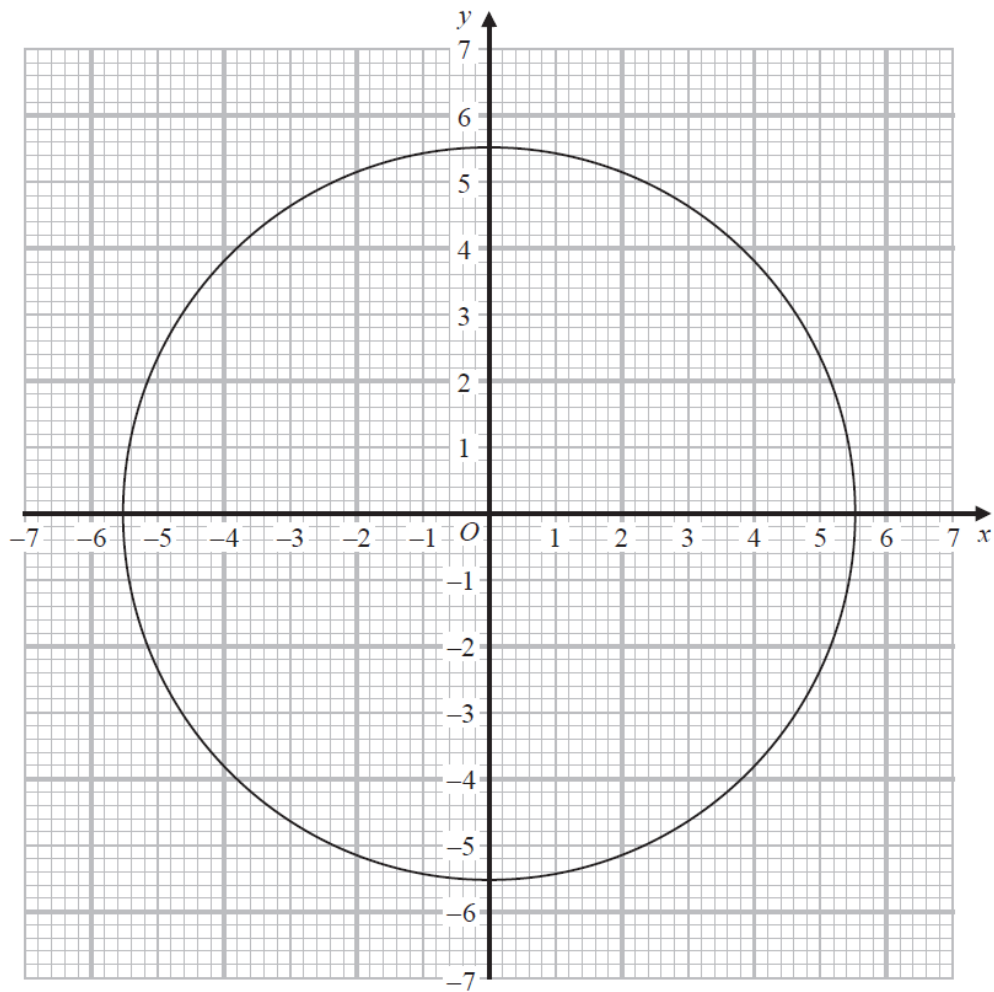
A tangent to C passes through the points $(-20, 0)$ and $(0, 10)$

Work out an equation of C.

You must show all your working.

.....
(Total for Question is 5 marks)

- 5 The diagram shows the graph of $x^2 + y^2 = 30.25$

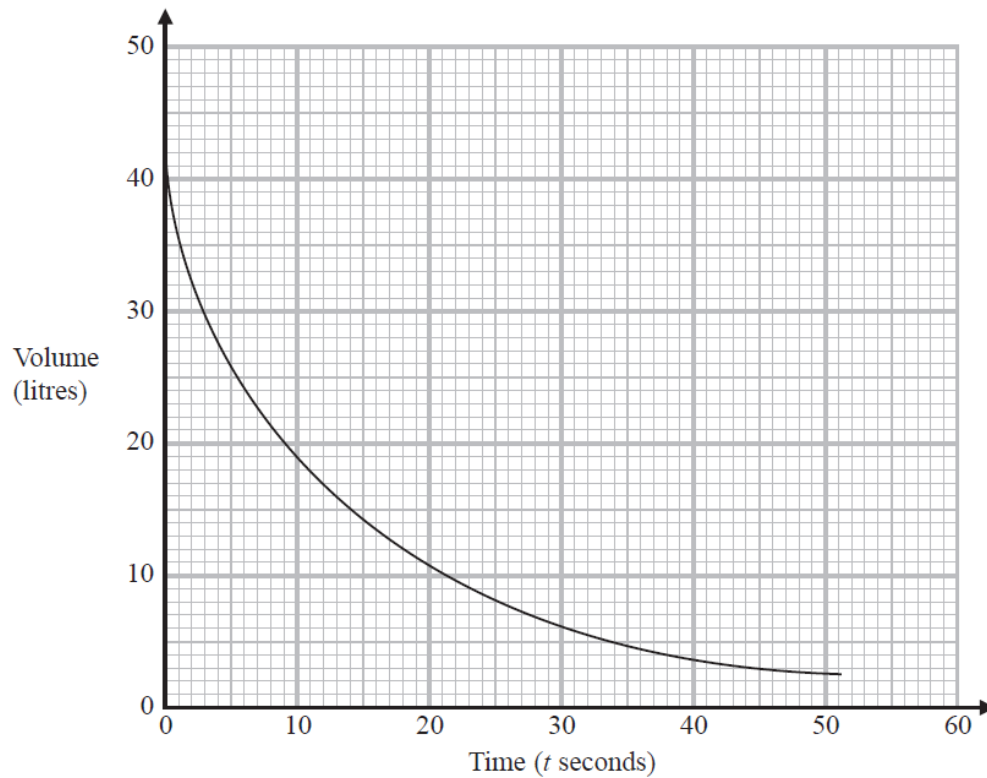


Use the graph to find estimates for the solutions of the simultaneous equations

$$\begin{aligned}x^2 + y^2 &= 30.25 \\ y - 2x &= 1\end{aligned}$$

(Total for Question is 3 marks)

- 6 The graph gives the volume of water, in litres, in a container at time t seconds after the water started to flow out of the container.



Using the graph, work out an estimate for the rate at which the water is flowing out of the container when $t = 12$
You must show your working.

..... litres per second

(Total for Question is 3 marks)