

Name: _____

GCSE (1 – 9)

Perpendicular Lines and the Equation of a Tangent

Instructions

- Use **black** ink or ball-point pen.
- Answer all questions.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- You must **show all your working out.**

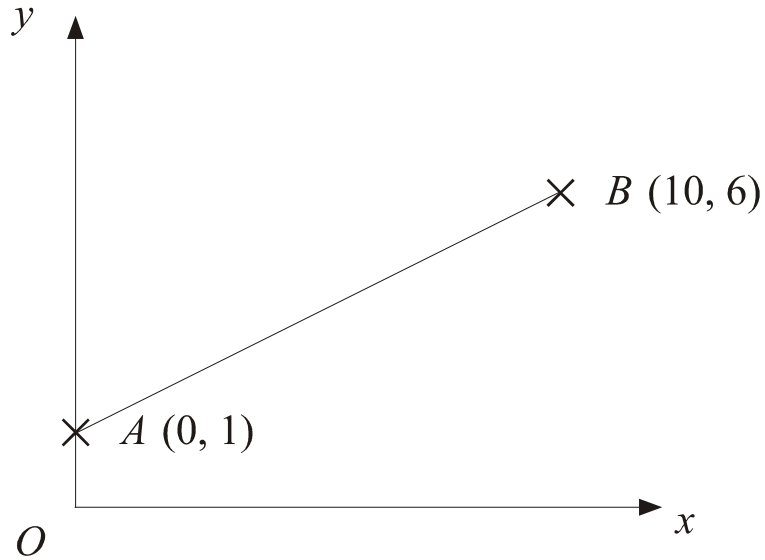
Information

- The marks for each question are shown in brackets – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end

1



A is the point $(0, 1)$

B is the point $(10, 6)$

The equation of the straight line through A and B is $y = \frac{1}{2}x + 1$

- (a) Write down the equation of another straight line parallel to $y = \frac{1}{2}x + 1$

.....
(1)

- (b) Write down the equation of another straight line that passes through the point $(0, 1)$

.....
(1)

- (c) Find the equation of the line perpendicular to AB passing through B .

.....
(3)
(Total for Question 1 is 5 marks)

- 2 A straight line, L , passes through the point with coordinates $(4, 7)$ and is perpendicular to the line with equation $y = 2x + 3$.

Find an equation of the straight line L .

(Total for Question 2 is 3 marks)

- 3 A straight line passes through the points $(0, 5)$ and $(3, 17)$

Find the equation of the straight line.

(Total for Question 3 is 3 marks)

4 Show that line $3y = 4x - 14$ is perpendicular to line $4y = -3x + 48$

(Total for Question 4 is 4 marks)

5 Here are the equations of 5 straight lines.

$$P: y = 2x + 5$$

$$Q: y = -2x + 5$$

$$R: y = x + 5$$

$$S: y = -\frac{1}{2}x + 6$$

$$T: y = \frac{1}{2}x + 1$$

(a) Write down the letter of the line that is parallel to $y = x + 6$

.....
(1)

(b) Write down the letter of the line that is perpendicular to $y = 2x - 1$

.....
(1)

(Total for Question 5 is 2 marks)

6 The point A has the coordinates $(2,5)$
The point B has the coordinates $(6,7)$

(a) Find the mid point of AB

.....
(2)

(b) Find the gradient of the line that passes through A and B .

.....
(2)

(c) Find the equation of the perpendicular bisector to AB .

.....
(3)

(Total for Question 6 is 7 marks)

- 7 A circle C has centre $(2,5)$
The point $A(11, 8)$ lies on the circumference of the circle.

Find the equation of the tangent to the circle at A .

(Total for Question 7 is 5 marks)

8 A circle has the equation $x^2 + y^2 = 5$

(a) Write down the coordinates of the centre of the circle.

.....
(1)

(b) Write down the exact length of the radius of the circle.

.....
(1)

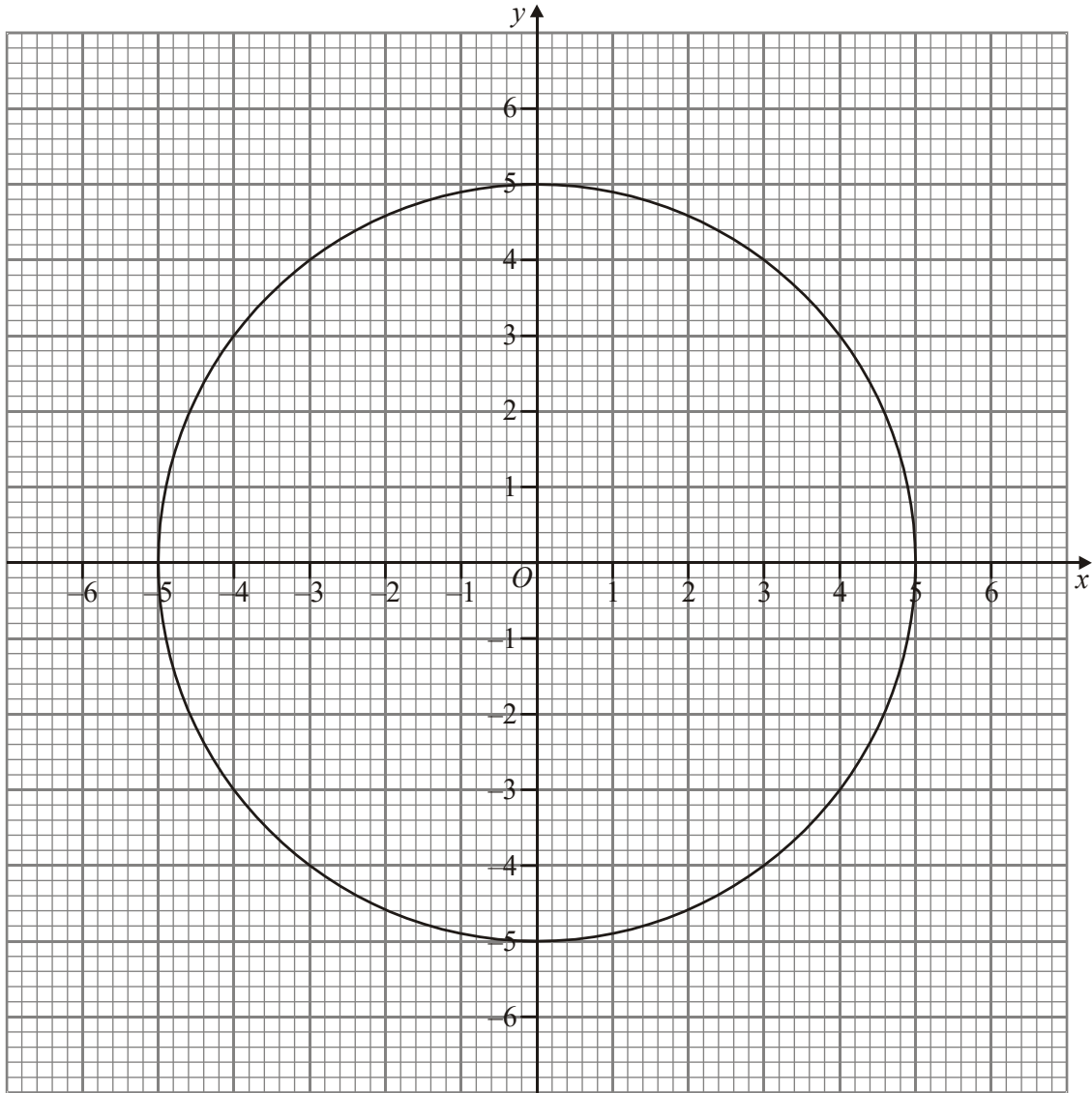
P is the point $(1,2)$ on the circle $x^2 + y^2 = 5$

(c) Work out the equation of the tangent to the circle at P .

.....
(4)

(Total for Question 8 is 6 marks)

- 9 The diagram shows a circle of radius 5 cm, centre the origin.



Find the equation of the tangent to the circle at (3,4).

.....
(Total for Question 9 is 5 marks)