Name:

Exam Style Questions

Equation of a Tangent to a Circle

Corbettmaths

Equipment needed: Ruler, calculator, pencil and pen

Guidance

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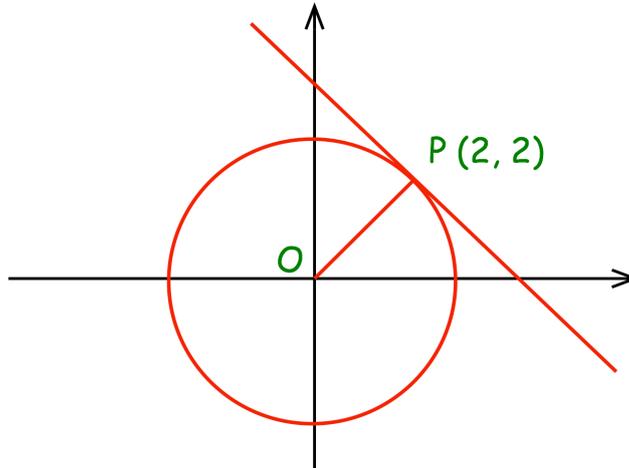
Video Tutorial

www.corbettmaths.com/contents

Video 372

Answers and Video Solutions

1. The diagram shows the circle $x^2 + y^2 = 8$ with a tangent at the point (2, 2)
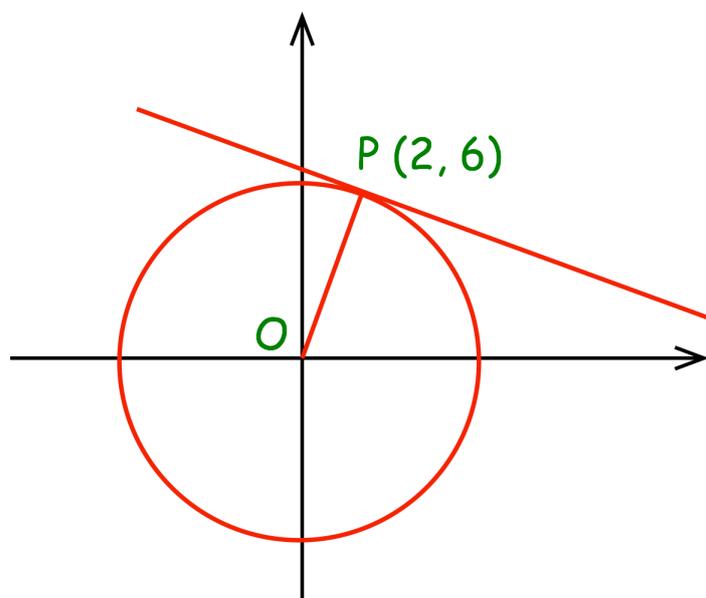

(a) Find the gradient of the line OP.

....
(1)

(b) Find the gradient of the tangent

....
(1)

(c) Find the equation of the tangent

....
(2)

2. The diagram shows the circle $x^2 + y^2 = 40$ with a tangent at the point (2, 6)
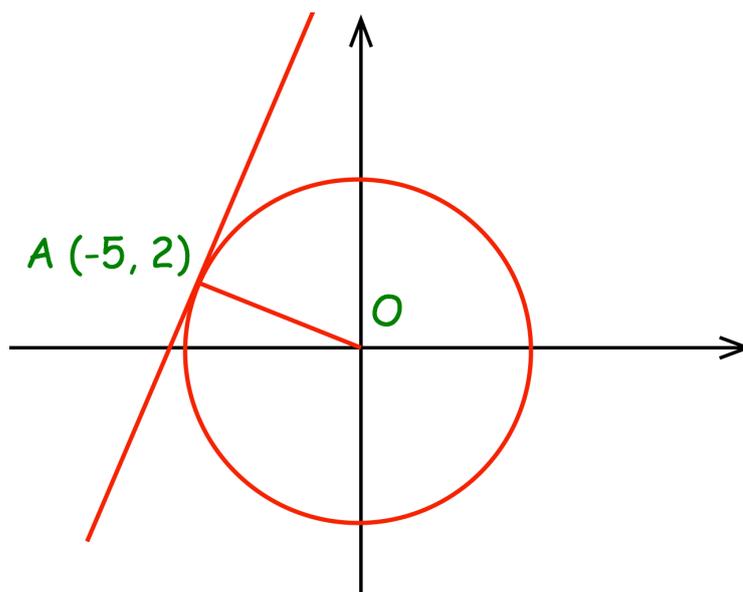
P (2, 6)

O

(a) Find the gradient of the line OP.

....
(1)

(b) Find the gradient of the tangent

....
(1)

(c) Find the equation of the tangent

....
(2)

3. The diagram shows the circle $x^2 + y^2 = 29$ with a tangent at the point $(-5, 2)$

A $(-5, 2)$

O

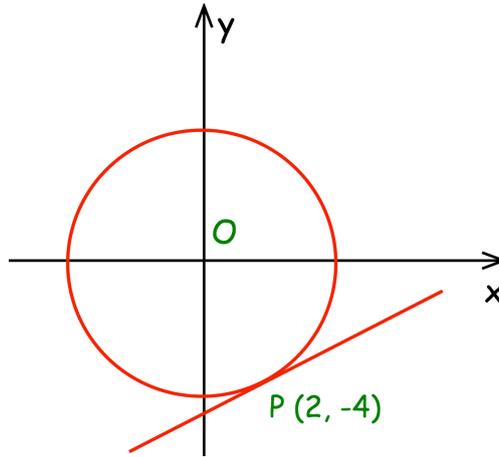(a) Find the gradient of the line AO.

....

(1)

(b) Find the gradient of the tangent

....

(1)

(c) Find the equation of the tangent

....

(2)

4. Here is a circle, centre O, and the tangent to the circle at the point (2, −4).

Find the equation of the tangent at the point P.

....

(3)

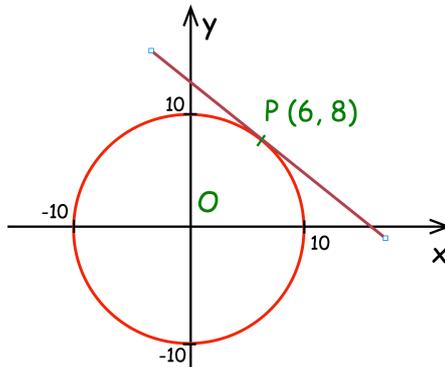5. Here is a circle, centre O, and the tangent to the circle at the point (6, 8).

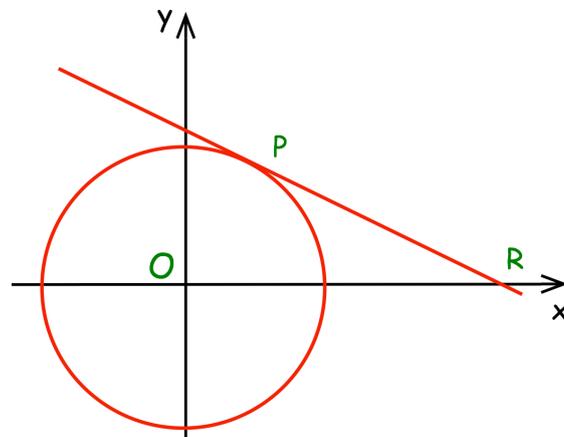Find the equation of the tangent at the point P.

....

(3)

6.   The line *l* is a tangent to the circle $x^2 + y^2 = 68$ at the point P.
      P is the point (2, 8)

      Work out the equation of the line *l*

      ....
                                                                        (3)

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7.   The diagram shows the circle $x^2 + y^2 = 17$

      P lies on the circle and has x-coordinate 1.
      The tangent at P intersects the x-axis at R.

      Work out the coordinates of R

      ....
                                                                        (5)

8. The points D (–12, –5) and E (12, 5) lie on the circle C.
    DE is a diameter of C.

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

    ....
    (1)

    (b) Work out the length of the radius of the C

    ....
    (1)

    (c) Write down the equation of C

    ....
    (1)

    (d) Find the equation of the tangent to the circle, C, at the point D.

    ....
    (4)

9. The point A (4, –6) lies on the circle with equation $x^2 + y^2 = 52$

Find the coordinates of the point where the tangent to the circle at A crosses the x-axis.

....
(4)

10. The point A (10, 5) lies on the circle $x^2 + y^2 = 125$

(a) Work out the equation of the tangent to the circle at the point A.

....

(3)

The tangent to the circle at the point B is parallel to the tangent to the circle at point A.

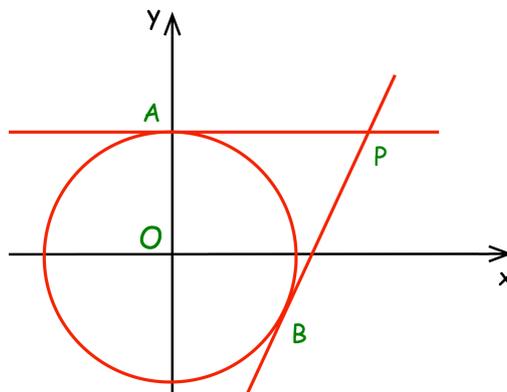(b) Work out the equation of the tangent to the circle at point B.

....

(3)

11.	The line *l* is a tangent to the circle $x^2 + y^2 = 90$ at the point P.
	P is the point (3, 9)
	The line *l* crosses the x-axis at the point Q.

	Work out the area of triangle OPQ.

	....

	(5)

12.	The circle $x^2 + y^2 = 25$ has tangents at the points A and B.
	The point A has coordinates (0, 5)
	The point B has coordinates (3, −4)

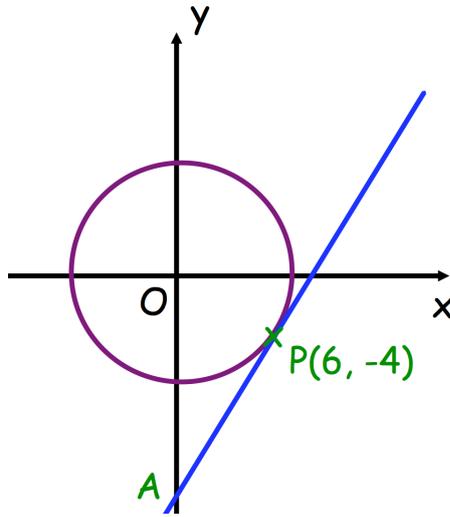	The tangents meet at the point P.

	Work out the coordinates of the point P.

	....

	(5)

13. A circle is drawn with centre (0, 0).
    The point P (6, −4) lie on the circle.

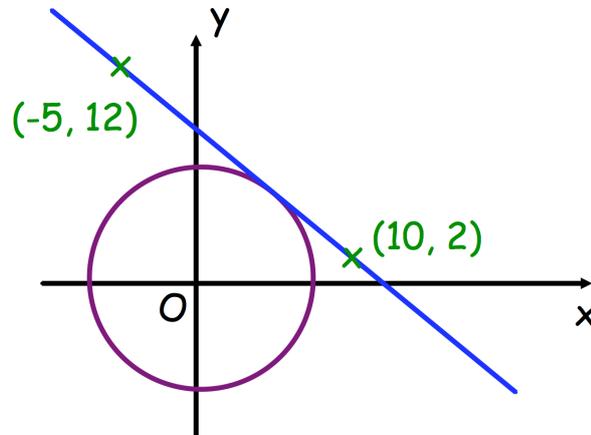   The tangent to the circle at P crosses the y-axis at the point A.

Work out the length of AP.

....

(5)

14. A circle is drawn with centre (0, 0).

A tangent to the circle passes through the points (–5, 12) and (10, 2)

(a) Find the equation of the tangent.

....
(2)

(b) Find the equation of the circle.

....
(4)

15. A circle is drawn with centre (8, −5)

The circle passes through the point P (12, 2)

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

....
(5)