Bishops Online Tutoring

Education Consultancy

Edexcel GCSE Mathematics

EQUATION OF A TANGENT TO A CIRCLE

Materials Required:
- Pen
- HB Pencil
- Ruler (in centimetres and millimetres)
- Protractor
- Compass

Instructions:
- Use a black ink pen to answer all questions
- Fill your name in the section below
- Answer the questions in the spaces provided
- Show your working out for all answers

Information:
- The marks allocated for each question are displayed within brackets – utilise this information to gauge the appropriate amount of time to dedicate to each question
- Questions marked with an asterisk (*) will assess your written communication; be careful of spelling, punctuation and grammar with these questions

Advice:
- Carefully read the question before attempting to answer it
- Be vary of time and try to answer every question
- If you have enough time in the end, go back and check your answers. A good way to check your answers is to retry the question with the hope of getting the same answer as before without looking at your working out from before

NO CALCULATOR ALLOWED

NAME:

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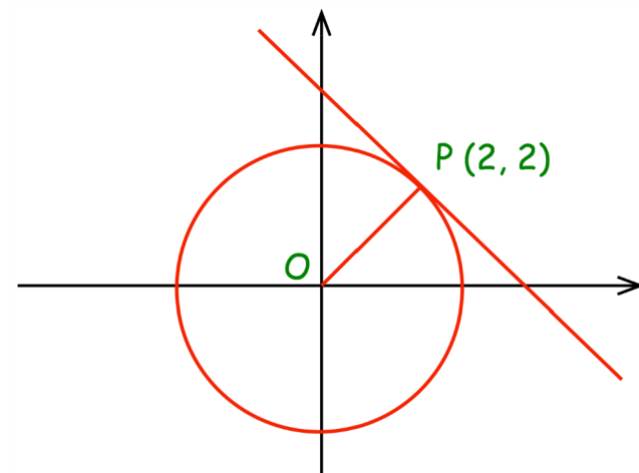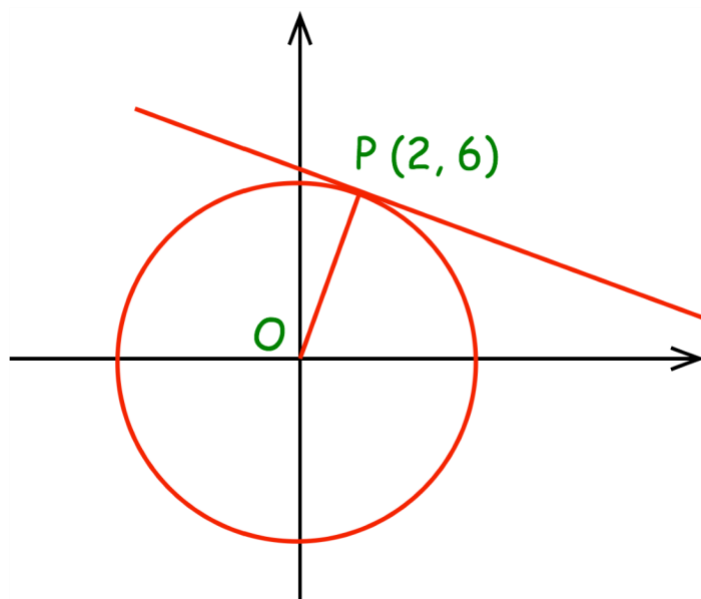

(a) Find the gradient of the line OP.

....
(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)
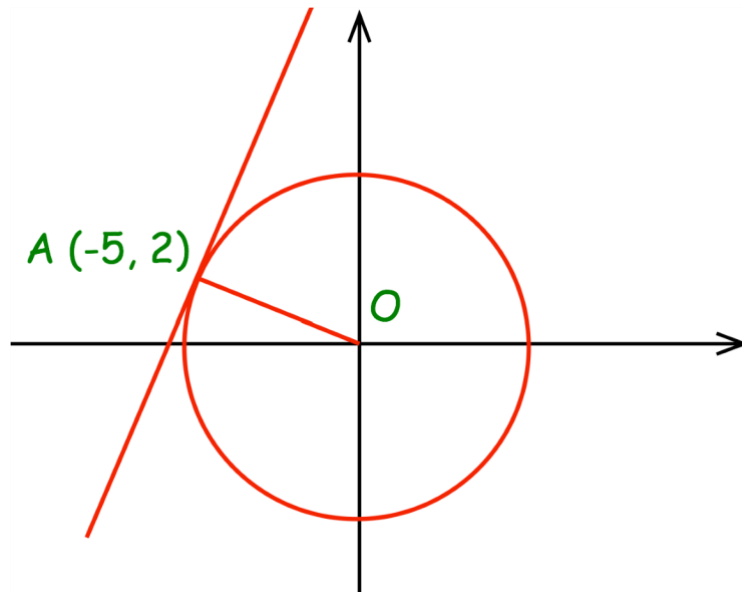

(a) Find the gradient of the line OP.

....

(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

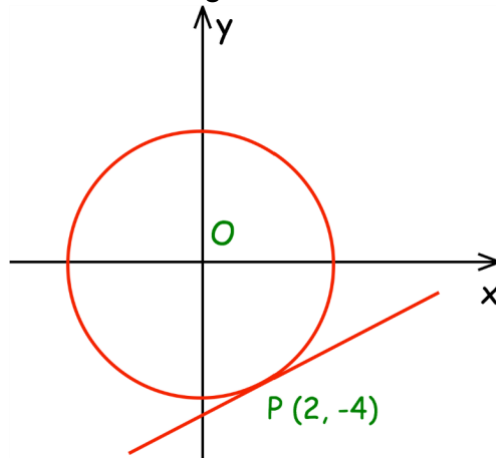(a) Find the gradient of the line AO.

....

(1)

(b) Find the gradient of the tangent

....

(1)

(c) Find the equation of the tangent
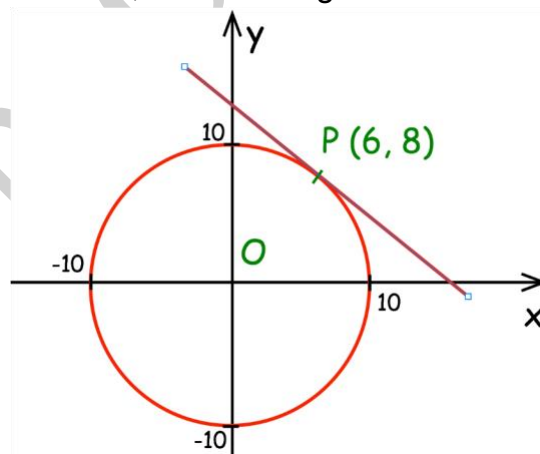
....

(2)

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

P (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).

P (6, 8)

Find the equation of the tangent at the point P.
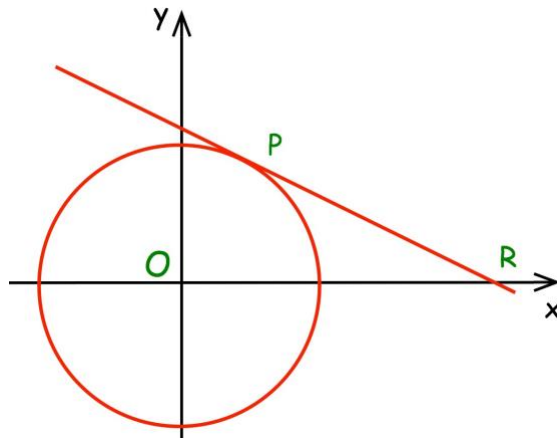
....

(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.
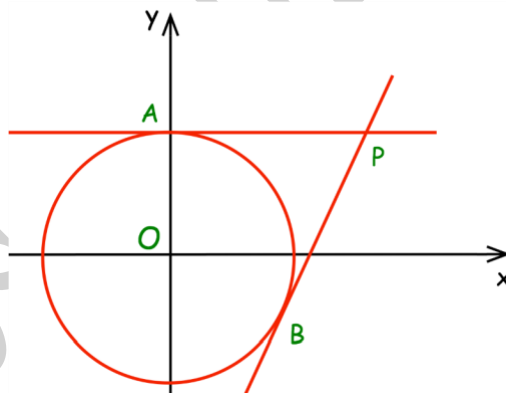The tangent at P intersects the x-axis at R.

Work out the coordinates of R

....

(5)

8. The line *l* is a tangent to the circle $x^2 + y^2 = 90$ at the point P.
P is the point with x-coordinate of 3.
The line *l* crosses the x-axis at the point Q.

Work out the area of triangle OPQ.

....
(5)

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9. 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)