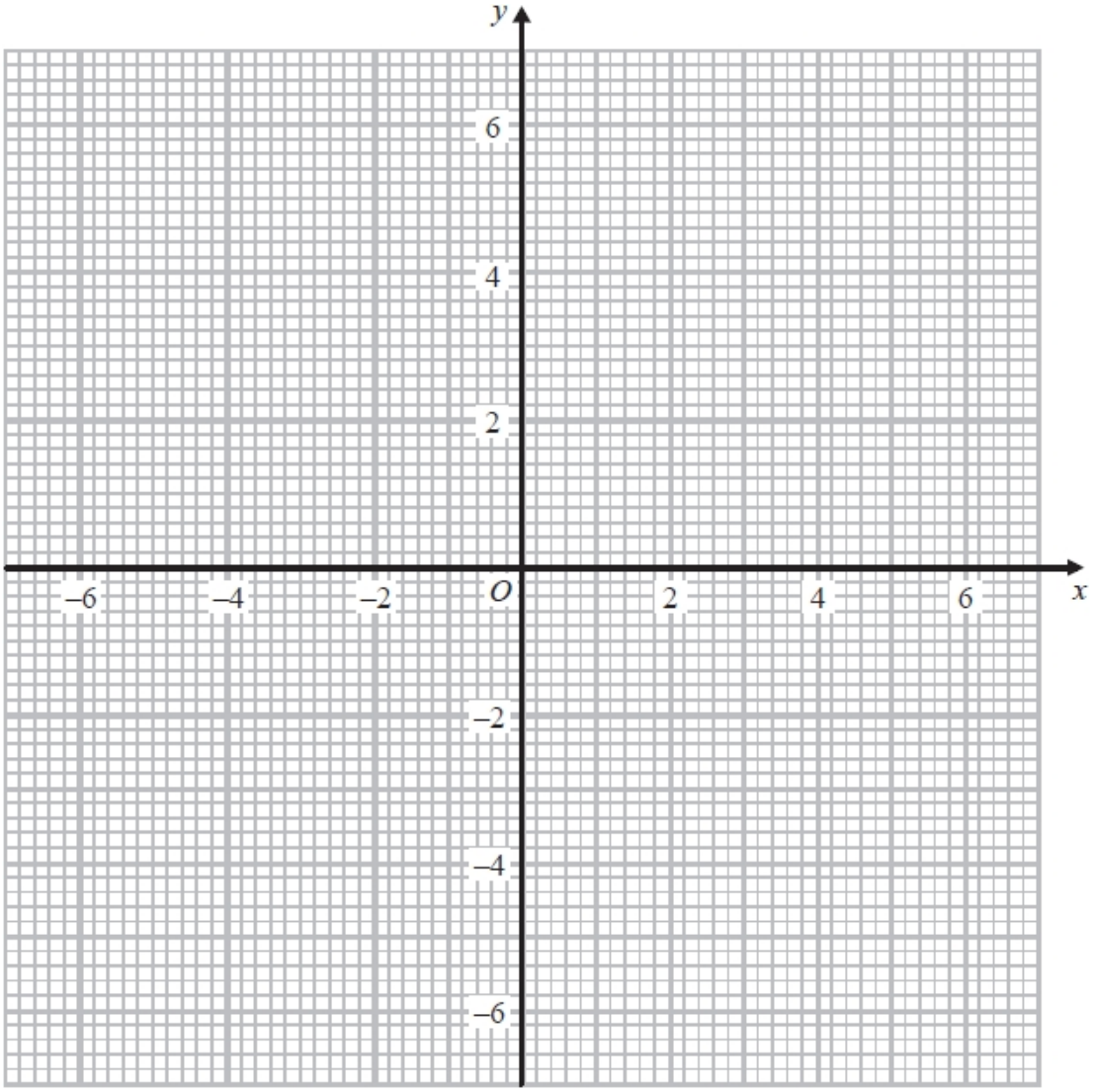
A177 Equations of circles

Q1.

(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 = 5 marks)

Q2.

L is the circle with equation $x^2 + y^2 = 4$

$P\left(\frac{3}{2}, \frac{\sqrt{7}}{2}\right)$ is a point on **L**.

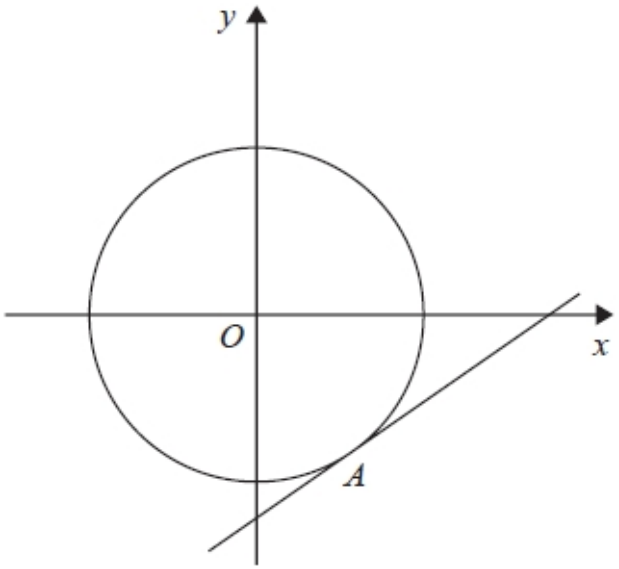
Find an equation of the tangent to **L** at the point *P*.

.....

(Total for question = 3 marks)

Q3.

The diagram shows the circle with equation $x^2 + y^2 = 261$



A tangent to the circle is drawn at point A with coordinates $(p, -15)$, where $p > 0$

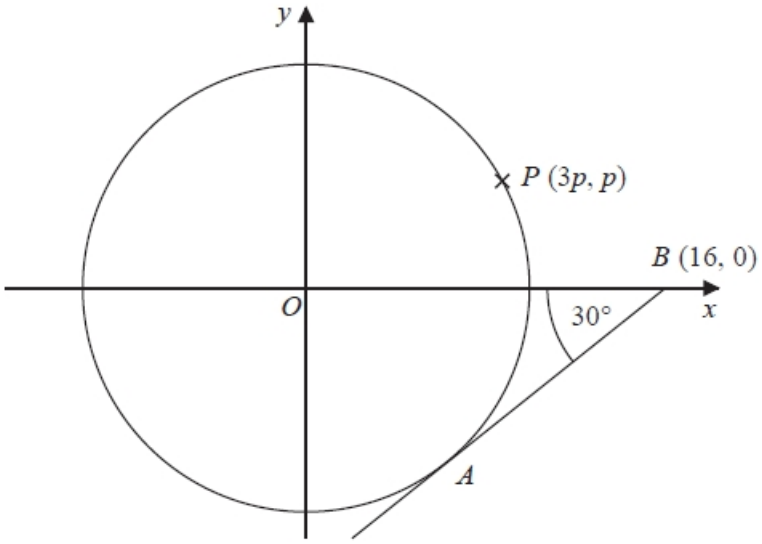
Find an equation of the tangent at A.

.....

(Total for question = 5 marks)

Q4.

The diagram shows a circle, centre *O*.



AB is the tangent to the circle at the point *A*.
Angle *OBA* = 30°

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

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

p = ...

(Total for question = 4 marks)

Q5.

The equation of a curve is $y = a^x$
A is the point where the curve intersects the y-axis.

(a) State the coordinates of A.

(..... , ...)

(1)

The equation of circle **C** is $x^2 + y^2 = 16$

The circle **C** is translated by the vector $\begin{pmatrix} 3 \\ 0 \end{pmatrix}$ to give circle **B**.

(b) Draw a sketch of circle **B**.

Label with coordinates
the centre of circle **B**
and any points of intersection with the x-axis.

(3)

(Total for question = 4 marks)

Q6.

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 = 5 marks)

Q7.

The line l is a tangent to the circle $x^2 + y^2 = 40$ at the point A.
A is the point (2, 6).

The line l crosses the x–axis at the point P.

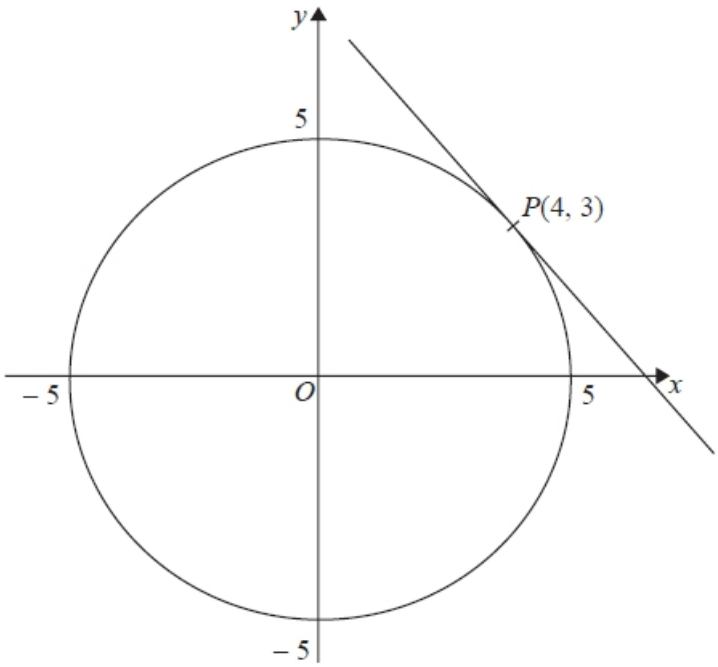
Work out the area of triangle OAP.

.....

(Total for question = 5 marks)

Q8.

Here is a circle, centre O, and the tangent to the circle at the point $P(4, 3)$ on the circle.



Find an equation of the tangent at the point P

.....

(Total for question is 3 marks)