10 A circle has equation $x^2 + y^2 + 4y - 21 = 0$ and a straight line has equation $2x + y - 8 = 0$.
The line intersects the circle at two points.

(a) Find the coordinates of these two points of intersection. [4]

(b) The circle has centre C and the two points of intersection are denoted by A and B.

Find the area of the triangle ABC. [3]

7 The coordinates of the points P and Q are (1, 1) and (7, 11) respectively. The line segment PQ forms a diameter of a circle.

(a) Find the equation of the circle. [4]

(b) Find the equation of the tangent to the circle at the point Q. [3]

(c) The other point on the circle with x-coordinate 7 is R.

Find the coordinates of the point of intersection of the tangent at Q with the tangent at R. [4]

6 The equation of a curve is $2x^2 - kxy + 2 = 0$ and the equation of a line is $y = px + 3$, where k and p are constants.

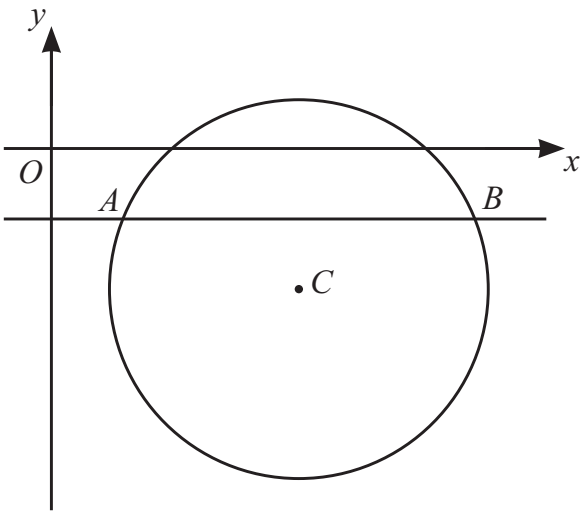
(a) Given that $k = 2$ and $p = 11$, find the coordinates of the points of intersection of the curve and the line. [4]

(b) Given instead that $p = 4$, find the set of values of k for which the curve and the line do not intersect. [5]

8 The circle with equation $x^2 + y^2 - 6x + 10y - 27 = 0$ intersects the line $x = -2$ at the points P and Q.

Find the area of the triangle formed by the tangents to the circle at P and Q, and the line $x = -2$. [8]

8



The diagram shows the circle with equation $x^2+y^2-14x+8y+36=0$ and the line $y=-2$. The line intersects the circle at the points A and B. The centre of the circle is C.

(a) Find the coordinates of A, B and C. [3]

(b) Find the angle ACB in radians. Give your answer correct to 3 significant figures. [2]

(c) The chord AB divides the circle into two segments.

Find the area of the larger segment. [4]