The Circle (Q 3, Paper 2)

1998

3 (a) A circle C, with centre (0, 0), passes through the point $(4, -3)$.

(i) Find the length of the radius of C.

(ii) Show, by calculation, that the point $(6, -1)$ lies outside C.

(b) The equation of the circle K is $(x-3)^2 + (y+2)^2 = 29$.

(i) Write down the radius length and the coordinates of the centre of K.

(ii) Find the coordinates of the two points where K intersects the x-axis.

(c) The line with equation $3x - y + 10 = 0$ is a tangent to the circle which has equation $x^2 + y^2 = 10$.

(i) Find the coordinates of a, the point at which the line touches the circle.

(ii) The origin is the midpoint of $[ab]$.
Find the equation of the tangent to the circle at b.

Answers

3 (a) (i) $r = 5$

(b) (i) $\sqrt{29}$, $(3, -2)$ (ii) $(-2, 0)$, $(8, 0)$

(c) (i) $a(-3, 1)$ (ii) $3x - y - 10 = 0$