CIRCLE (Q 1, PAPER 2)

2000

1 (a) The equation of a circle is $x^2 + y^2 = 130$.
Find the slope of the tangent to the circle at the point $(-7, 9)$.

1 (b) $x^2 + y^2 - 6x + 4y - 12 = 0$ is the equation of a circle.
Write down the coordinates of its centre and the length of its radius.
$x^2 + y^2 + 12x - 20y + k = 0$ is another circle, where $k \in \mathbf{R}$.
The two circles touch externally. Find the value of k.

1 (c) A circle intersects a line at the points $a(-3, 0)$ and $b(5, -4)$.
The midpoint of $[ab]$ is m. Find the coordinates of m.
The distance from the centre of the circle to m is $\sqrt{5}$.
Find the equations of the two circles that satisfy these conditions.

ANSWERS

1 (a) $\frac{7}{9}$

1 (b) $(3, -2)$; $r = 5$, $k = 36$

1 (c) $m(1, -2)$; $x^2 + y^2 + 8y - 9 = 0$, $x^2 + y^2 - 4x - 21 = 0$