THE CIRCLE (Q 3, PAPER 2)

2001

3 (a) The circle S has equation $(x-3)^2+(y-4)^2=25$.

(i) Write down the centre and the radius of S.

(ii) The point $(k, 0)$ lies on S. Find the two real values of k.

(b) Prove that the line $x-3y=10$ is a tangent to the circle with equation $x^2+y^2=10$ and find the coordinates of the point of contact.

(c) C is a circle with centre (0, 0). It passes through the point $(1, -5)$.

(i) Write down the equation of C.

(ii) The point (p, p) lies inside C where $p \in \mathbf{Z}$.
Find all the possible values of p.

ANSWERS

3 (a) (i) $(3, 4)$, $r = 5$ (ii) $k = 0, 6$

(b) $(1, -3)$

(c) (i) $x^2+y^2=26$ (ii) $\{-3, -2, -1, 0, 1, 2, 3\}$