CIRCLE (Q 1, PAPER 2)

1998

1 (a) $p(k, 2)$ and $q(-6, -k)$ are the end points of a diameter of a circle S with centre $(3, -5)$.
Find the value of k.
Verify that the radius length of S is $\sqrt{130}$.

(b) K is the circle with equation $x^2 + y^2 = 100$.
Show, by calculation, that the point $a(12, -9)$ lies outside K.
Find the equation of the line oa, where o is the origin.
Find the coordinates of the points where oa intersects K.

(c) A circle of radius length $\sqrt{20}$ contains the point $(-1, 3)$. Its centre lies on the line $x + y = 0$.
Find the equations of the two circles that satisfy these conditions.

ANSWERS

1 (a) $k = 12$

(b) $3x + 4y = 0$; $(8, -6), (-8, 6)$

(c) $x^2 + y^2 - 2x + 2y - 18 = 0, x^2 + y^2 + 10x - 10y - 30 = 0$