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PURE MATH

ALGEBRA AND FUNCTION

Level & Board	EDEXCEL (A-LEVEL)
TOPIC:	CIRCLES
PAPER TYPE:	QUESTION PAPER - 3
TOTAL QUESTIONS	8
TOTAL MARKS	64

Questions

Q1.

The circle C has equation

$$x^2 + y^2 - 4x + 8y - 8 = 0$$

(a) Find

(i) the coordinates of the centre of C

(ii) the exact radius of C

(5)

The straight line with equation x = k, where k is a constant, is a tangent to C.

(b) Find the range of values for k.

(3)

(Total for question = 8 marks)

Q2.

The Circle C has the equation

$$x^2 + y^2 - 6x - 4y + 12 = 0$$

(a) Find

(i) the coordinates of the centre of C

(ii) the exact radius of C

(5)

The straight line with equation x = k, where k is a constant, is a tangent to C.

(b) Find the range of values for k.

(4)

(Total for question = 9 marks)

Q3.

The Circle C has the equation

$$x^2 + y^2 - 8x + 6y + 16 = 0$$

(a) Find the coordinates of the center of S.

(4)

(b) Find the radius of S.

(2)

(Total for question = 6 marks)

Q4.

The Circle C has the equation

$$x^2 + y^2 + 2x - 6y + 5 = 0$$

(a) Find the coordinates of the center of C.

(4)

(b) Find the radius of C.

(2)

(c) Find the range of values for k.

(3)

(Total for question = 9 marks)

Q5.

A circle C with centre at (– 2, 6) passes through the point (10, 11).

(a) Show that the circle C also passes through the point (10, 1).

(3)

The tangent to the circle C at the point (10, 11) meets the y axis at the point P and the tangent to the circle C at the point (10, 1) meets the y axis at the point Q.

(b) Show that the distance PQ is 58 explaining your method clearly

(7)

(Total for question = 10 marks)

Q6.

Consider a triangle PQR in the coordinate plane with vertices p(3,2), Q(8,4), and R(6,−1).Find the equations of the medians PM, QN and RO where M, N, and O are the midpoints of QR, RP, and RP respectively.

(5)

(Total for question = 5 marks)

Q7.

The circle C has equation

$$x^2 + y^2 - 6x + 10y + 9 = 0$$

(a) Find

(i) the coordinates of the centre of C

(ii) the radius of C

(5)

The line with equation y = kx, where k is a constant, cuts C at two distinct points.

(b) Find the range of values for k.

(3)

(Total for question = 8 marks)

Q8.

The Circle C has the equation

$$x^2 + y^2 - 8x + 6y + 16 = 0$$

(a) Find the coordinates of the center of C4.

(4)

(b) Find the radius of C4.

(2)

(c) Find the range of values for k.

(3)

(Total for question = 9 marks)

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