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PURE MATH

ALGEBRA AND FUNCTION

Level & Board	EDEXCEL (A-LEVEL)
TOPIC:	CIRCLES
PAPER TYPE:	QUESTION PAPER - 6
TOTAL QUESTIONS	8
TOTAL MARKS	64

Questions

Q1.

Show that the circles
$x^2 + y^2 + 2x - 2y - 7 = 0$ and $x^2 + y^2 - 6x + 4y - 9 = 0$ touch externally.

(7)

(Total for question = 7 marks)

Q2.

(i) A circle C_1 has equation

$$x^2 + y^2 + 18x - 2y + 30 = 0$$

The line l is the tangent to C1 at the point P(−5, 7).

Find an equation of l in the form ax + by + c = 0, where a, b and c are integers to be found.

(5)

(ii) A different circle C_2 has equation

$$x^2 + y^2 - 8x + 12y + k = 0$$

where k is a constant.

Given that C_2 lies entirely in the 4th quadrant, find the range of possible values for k.

(4)

(Total for question = 8 marks)

Q3.

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)

Q4.

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)

Q5.

Find an equation of the circle with centre at $(5, -2)$ and radius is 4.

I am Sorry !!!!!

(5)

(Total for question = 5 marks)

Q6.

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)

Q7.

A circle with radius 'r' that is located in the 1st quadrant, touching the x-axis, and is tangent to the line 'l' with the equation 'y=x+5'.

(a) Show that the x-coordinates of the points where 'l' intersects with the circle satisfy the equation 'x^2 - 10x + 25 - r^2 = 0'.

(4)

(b) Given that 'l' is a tangent to the circle, we need to find the possible values of 'r'.

(3)

(Total for question = 7 marks)

Q8.

A circle (C) with radius (r) lies in the third quadrant, touches the x-axis and is tangent to the line (l) with the equation 2x + 5y = 15.

a) Prove that the x-coordinates of the points where (l) intersects with (C) satisfy the equation 5x^2 + 20x + 25 - r^2 = 0.

(3)

b) Given that (l) is a tangent to (C), determine the possible values of (r).

(4)

(Total for question = 7 marks)

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