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PURE MATH

ALGEBRA AND FUNCTION

Level & Board	EDEXCEL (A-LEVEL)
TOPIC:	CIRCLES
PAPER TYPE:	QUESTION PAPER - 5
TOTAL QUESTIONS	8
TOTAL MARKS	64

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Questions

Q1.

A circle C with radius r

- lies only in the 1st quadrant
- touches the x-axis and touches the y-axis

The line l has equation 2x + y = 12

(a) Show that the x coordinates of the points where l intersects with C satisfy the equation $5x^2 + (2r - 48)x + (r^2 - 24r + 144) = 0$.

Given also that l is a tangent to C,

(b) Given that l is a tangent to C, find the two possible values of r. Please provide your answers as fully simplified surds.

> (4) (Total for question = 7 marks)

(3)

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Q2.

A circle C with radius r

- lies only in the 1st quadrant
- touches the x-axis and touches the y-axis

The line l has equation 2x + y = 12

(a) Show that the x coordinates of the points where l intersects with C satisfy the equation $5x^2 + (2r - 48)x + (r^2 - 24r + 144) = 0$.

(3)

Given also that l is a tangent to C,

(b) Given that l is a tangent to C, find the two possible values of r. Please provide your answers as fully simplified surds.



Q3.

A circle, denoted by C, with a radius r lies in the first quadrant, touches the x-axis, and is tangent to the line L with the equation y=2x+8.

(a) Show that the x-coordinates of the points where line L intersects with circle C satisfy the equation $(x^2 - 16x + 64 - r^2) = 0$.

(3)

(b) Given that line L is a tangent to circle C, determine the possible values of

r.

(4) (Total for question = 7 marks)



Q4.

A circle, denoted by C, with a radius r lies in the first quadrant, touches the x-axis, and is tangent to the line L with the equation y=2x+8.

(a) Show that the x-coordinates of the points where line L intersects with circle C satisfy the equation $(x^2 - 16x + 64 - r^2) = 0$.

(3)

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

(4) (Total for question = 7 marks)



Q5.

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 (1) 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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Q6.

A circle with a radius is situated in the fourth quadrant, touches the y-axis, and is tangent to the line with the equation 3x - 4y = 12. (a) Prove that the y coordinates of the points where line intersects with circle satisfy the equation $16y^2 - 96y + 144 - 9r^2 = 0$.

(3)

(b) Assuming that line is a tangent to circle , determine the possible values of radius.

(4)

(Total for question = 7 marks)

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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" that is located in the second quadrant, touches the y-axis, and is tangent to the line "1" with the equation 2x+3y=6.

(a) Show that the y-coordinates of the points where "l" intersects with "C"

satisfy the equation $9y^2+36y+36-4r^2=0$.

(4)

(b) Given that "l" is a tangent to "C", find the possible values of "r". Please provide your answers.

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(3)

(Total for question = 7 marks)

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