MME
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GCSE MATHEMATICS

AQA | Edexcel | OCR | WJEC

(Level 7 - 9)

Circle Graphs and Tangents

Please write clearly in block capitals

Forename:
Surname:

Materials

For this paper you must have:
- mathematical instruments

You ***can*** use a calculator.

Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer all questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- You may ask for graph paper, tracing paper and more answer paper. These must be tagged securely to this answer book.

Advice

- In all calculations, show clearly how you work out your answer.

1(a) Which of the following equations represents a circle with a centre at $(0,0)$ and a radius of 8? *(Level 7)*

Circle your answer.

[1 mark]

$x^2 + y^2 = 16$ $\quad$ $(x+8)^2 + y^2 = 0$

$x^2 + y^2 = 64$ $\quad$ $x^2 + (y+8)^2 = 0$

1(b) Which of the following equations represent a line that passes through the point $(0,7)$ and is tangent to a circle at point $(3,4)$?

Circle your answer.

[1 mark]

$y = \frac{3}{4}x + 7$ $\quad$ $y = -x + 7$

$y = 7x + \frac{3}{4}$ $\quad$ $y = 7x - 1$

1(c) Describe the circle given the following equation: $x^2 + y^2 = 25$

Circle your answer.

[2 marks]

Centre, $(0,0)$
Radius, 50

Centre, $(0,0)$
Radius, 10

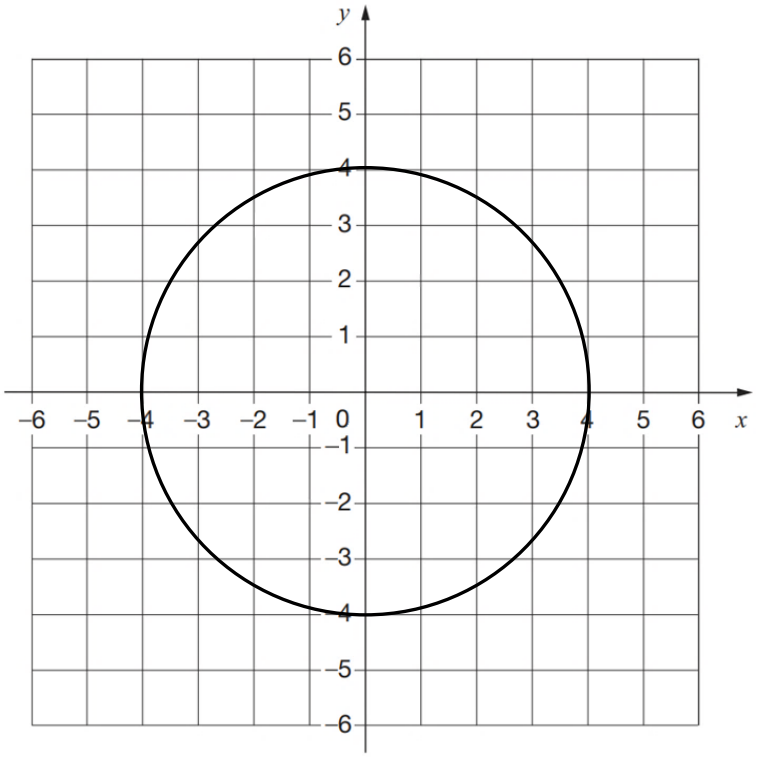
Centre, $(0,0)$
Radius, 12.5

Centre, $(0,0)$
Radius, 5

Turn over for next question

4

2 Consider the following circle with centre at $(0,0)$ which crosses the point, $(-4,0)$. *(Level 7)*



2(a) What is the diameter of the circle?

[1 mark]

Answer _____

2(b) What is the equation of this circle?

[3 marks]

Answer _____

Turn over for next question

4

3(a) Determine the radius for the following circle: $x^2 + y^2 = 32$. *(Level 8)*

Give your answer in surd form.

[2 marks]

Answer _____

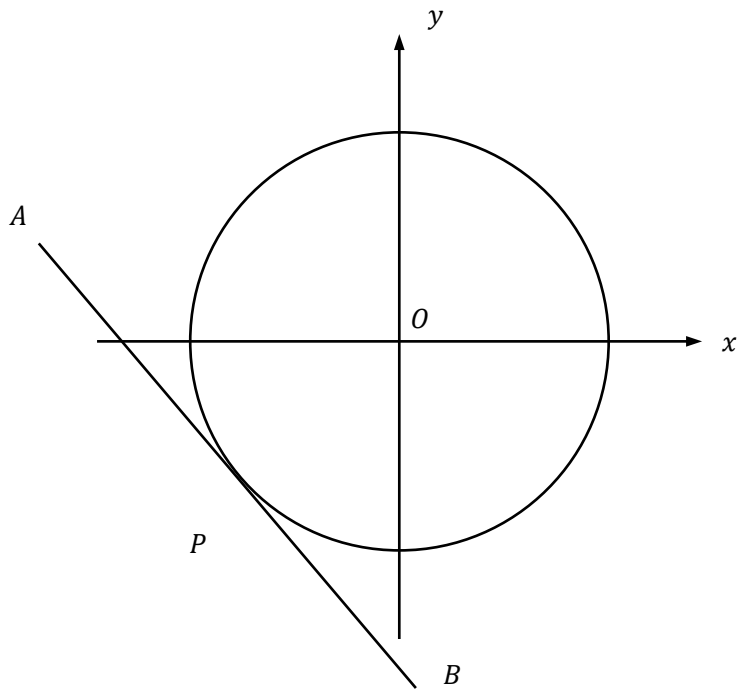
3(b) If the centre of the circle was moved 3 places to the left and 5 places up, what would the origin be?

[2 marks]

Answer _____

4 Consider the following circle, with centre $(0,0)$ *(Level 9)*

Point P has the coordinates $(-3,\ -5)$



Work out the equation of the tangent, AB, to the circle at point P.

Give your answer in the form $ay = bx + d$ where a, b and d are integers.

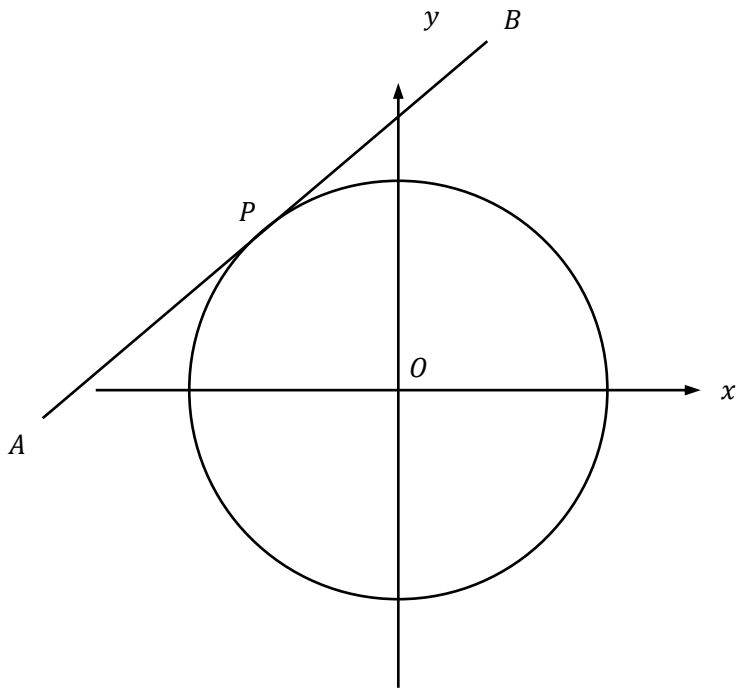
[3 marks]

Answer _____

3

5 Consider the following circle, with centre $(0,0)$, and a radius of 5 *(Level 9)*

Point P has the coordinates $(-3,4)$



Work out the equation of the tangent, AB, to the circle at point P.

Give your answer in the form $ay = bx + d$, where a, b and d are integers.

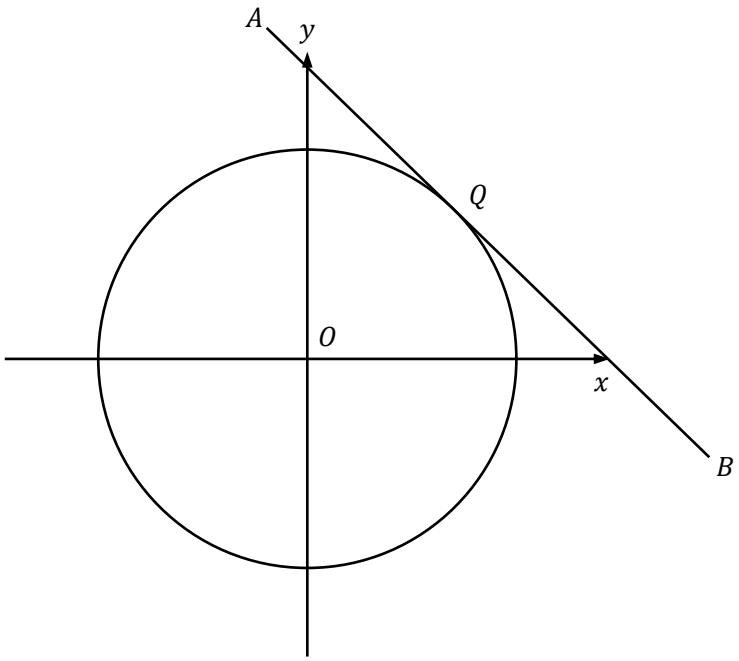
[3 marks]

Answer _____

3

6 Consider the following circle, with centre $(0,0)$, and a radius of 12 *(Level 9)*

Point Q has the coordinates $(5,13)$



Work out the equation of the tangent, AB, to the circle at point Q.

Give your answer in the form $ay = bx + d$, where a, b and d are integers.

[3 marks]

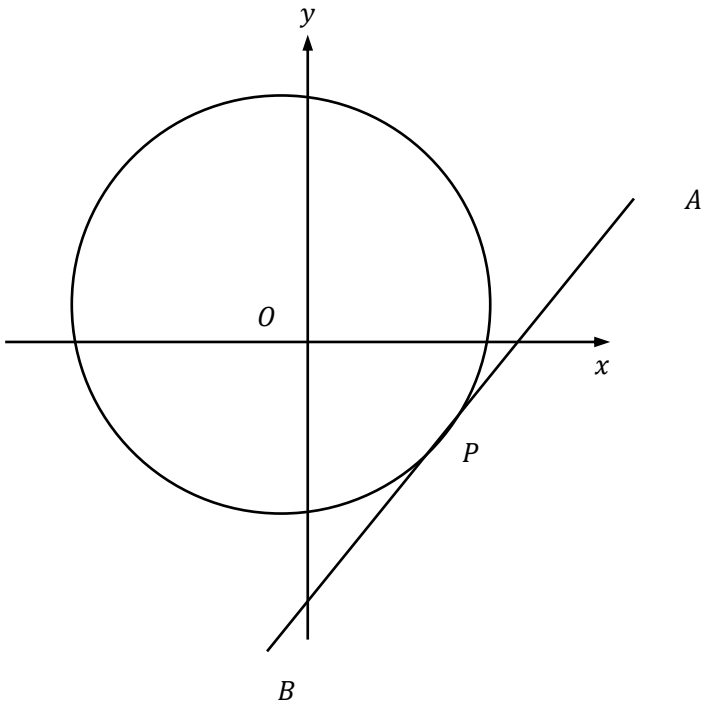
Answer _____

Turn over for next question

3

7 Consider the following circle, with centre $(-1,2)$, and a radius of 5 *(Level 9)*

Point P has the coordinates $(2,-2)$



Work out the equation of the tangent, AB, to the circle at point P.

Give your answer in the form $ay = bx + d$, where a, b and d are integers.

[3 marks]

Answer _____

3

8 Find the equation of a circle, with centre $(0,0)$, where the tangent meets the circle at $(\frac{12}{5}, -\frac{4}{5})$ *(Level 9)*

[3 marks]

Answer _____

3

END