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GCSE MATHS

Algebra

Edexcel 1MA1 | Subtopic collection Topic 29

Equation of a circle and tangents

Higher tier

Past paper question booklet

11	2017-2025	Higher
question groups	available papers	tier

Before you begin

1. Show working and use units where appropriate.
2. Use extra paper if you need more space.
3. Print at actual size (100%) for measurement questions.

Name _____ **Date** _____

Whole questions are retained for context; some parts cover other points. Legacy sources are labelled.

23 **L** is the circle with equation $x^2 + y^2 = 4$

$P\left(\frac{3}{2}, \frac{\sqrt{7}}{2}\right)$ is a point on **L**.

Find an equation of the tangent to **L** at the point P.

.....

(Total for Question 23 is 3 marks)

20 The equation of a curve is $y = a^x$
A is the point where the curve intersects the y-axis.

(a) State the coordinates of A.

(..... , ...)
(1)

The equation of circle **C** is $x^2 + y^2 = 16$

The circle **C** is translated by the vector $\begin{pmatrix} 3 \\ 0 \end{pmatrix}$ to give circle **B**.

(b) Draw a sketch of circle **B**.

Label with coordinates
the centre of circle **B**
and any points of intersection with the x-axis.

(3)

(Total for Question 20 is 4 marks)

Question 03

19 Prove algebraically that the straight line with equation $x - 2y = 10$ is a tangent to the circle with equation $x^2 + y^2 = 20$

(Total for Question 19 is 5 marks)

Question 04

15 The equation of a circle is $x^2 + y^2 = 42.25$

Find the radius of the circle.

.....

(Total for Question 15 is 1 mark)

22 **C** is a circle with centre the origin.

A tangent to **C** passes through the points (–20, 0) and (0, 10)

Work out an equation of **C**.
You must show all your working.

.....

(Total for Question 22 is 5 marks)

20 The centre of a circle is the point with coordinates $(-1, 3)$

The point A with coordinates $(6, 8)$ lies on the circle.

Find an equation of the tangent to the circle at A.
Give your answer in the form $ax + by + c = 0$ where a, b and c are integers.

.....

(Total for Question 20 is 4 marks)

24 A circle has equation $x^2 + y^2 = 12.25$

The point P lies on the circle.
The coordinates of P are (2.1, 2.8)

The line **L** is the tangent to the circle at point P.

Find an equation of **L**.
Give your answer in the form $ax + by = c$, where a, b and c are integers.

.....

(Total for Question 24 is 4 marks)

23 A circle has equation $x^2 + y^2 = 25$

The point P with coordinates $(-3, 4)$ lies on the circle.

Alex says that the tangent to the circle at P crosses the x-axis at the point $(-8, 0)$

Is Alex correct?
You must show how you get your answer.

(Total for Question 23 is 4 marks)

20 **C** is the circle with equation $x^2 + y^2 = 4$

Find an equation of the tangent to **C** at the point $(p, 1)$ where $p > 0$
Give your answer in the form $y + \sqrt{a}x = b$ where a and b are integers.
You must show all your working.

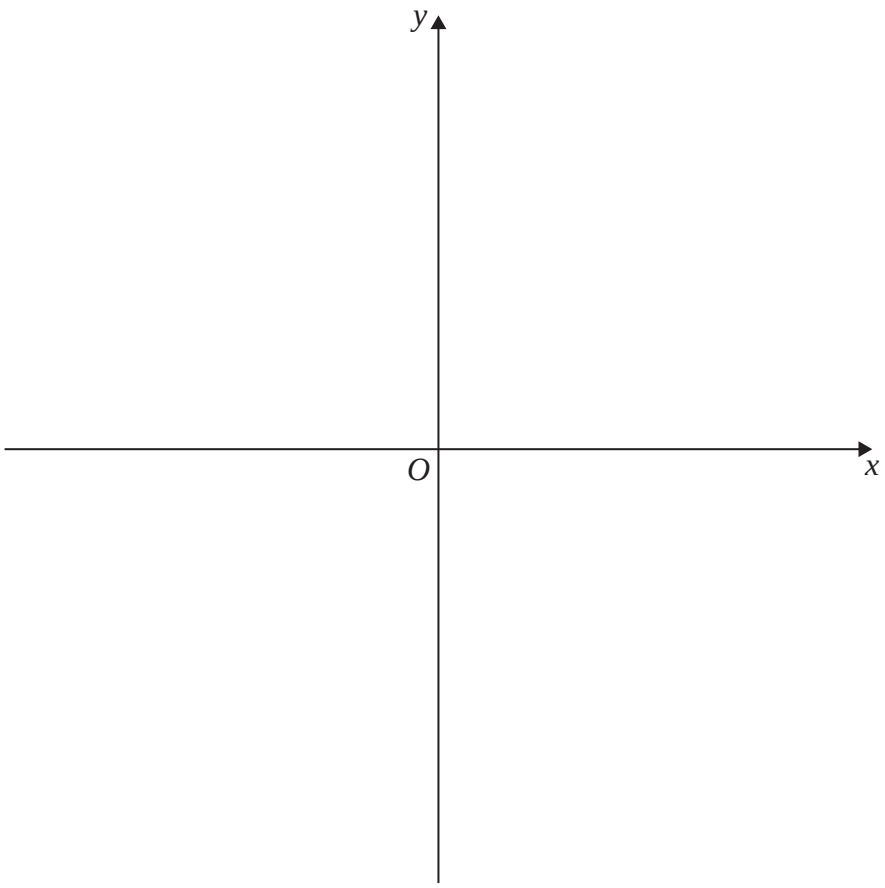
.....

(Total for Question 20 is 4 marks)

22 The equation of circle **A** is $x^2 + y^2 = 25$

Circle **A** is translated by the vector $\begin{pmatrix} 0 \\ -2 \end{pmatrix}$ to give circle **B**.

Sketch circle **B**.
Show the coordinates of
the centre of circle **B**
and the points where circle **B** meets the *y*-axis.



(Total for Question 22 is 3 marks)

22 **C** is a circle with centre (0, 0)
The straight line with equation $3x - 2y = 52$ is the tangent to **C** at the point P.

Find the coordinates of P.

(..... , ...)

(Total for Question 22 is 4 marks)