Write your name here

Surname | Other names

Centre Number | Candidate Number

Pearson Edexcel
Level 1/Level 2 GCSE (9–1)

Mathematics

Coordinate geometry_Circles

Paper Reference
1MA1

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – there may be more space than you need.
- You must **show all your working.**
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.

Information

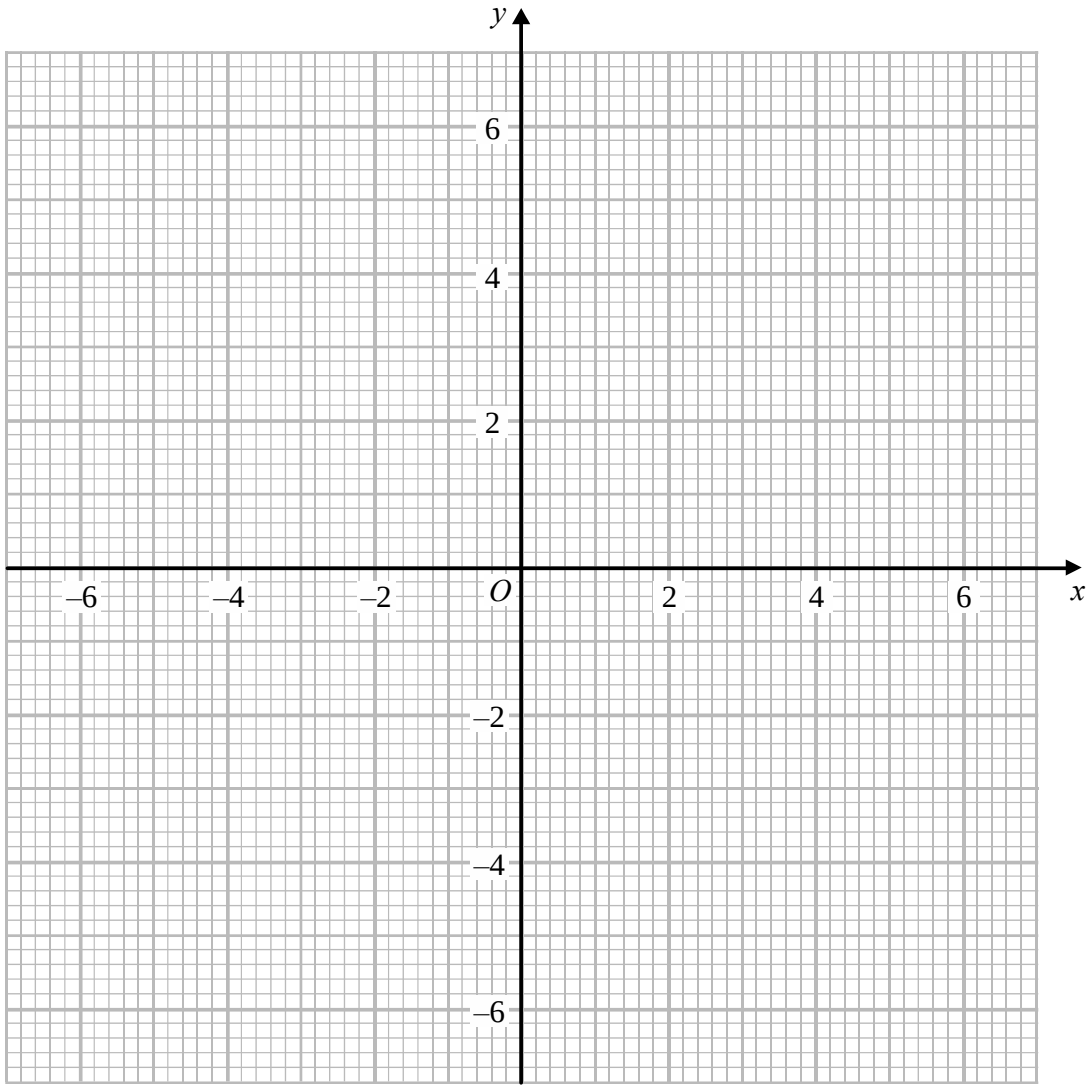
- The total mark for this paper is **34**. There are **9** questions.
- Questions have been arranged in an ascending order of mean difficulty, as found by all students in the June 2017–November 2019 examinations.
- The marks for **each** question are shown in brackets
  – use this as a guide as to how much time to spend on each question.

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

1MA1 Higher themed papers: Coordinate geometry_Circles

1 (*a*) On the grid, draw the graph of $x^2 + y^2 = 12.25$



(2)

(*b*) Hence find estimates for the solutions of the simultaneous equations

$$x^2 + y^2 = 12.25$$
$$2x + y = 1$$

.....

(3)

(Total for Question 1 is 5 marks)

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

Find the radius of the circle.

.....

(Total for Question 2 is 1 mark)

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3 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 3 is 4 marks)

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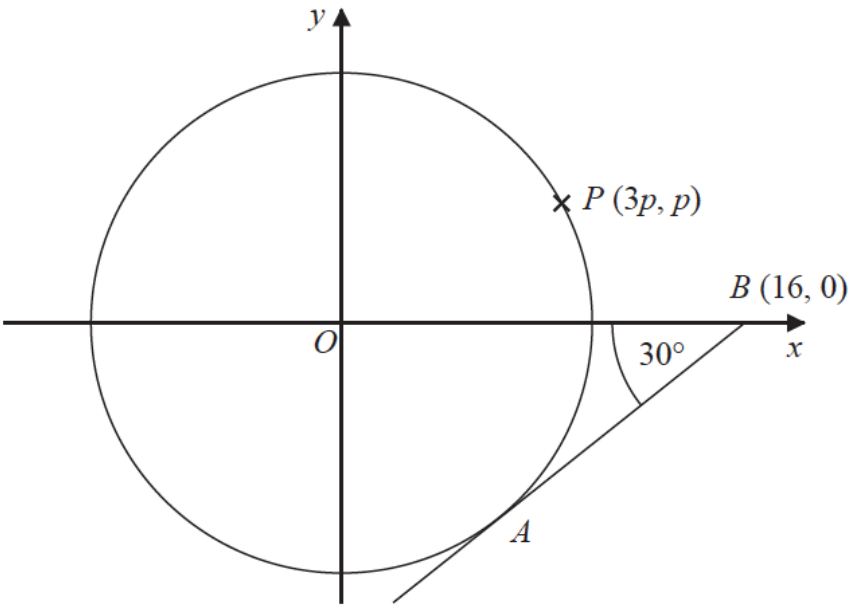
4 The diagram shows a circle, centre O.



AB is the tangent to the circle at the point A.
Angle $OBA = 30°$

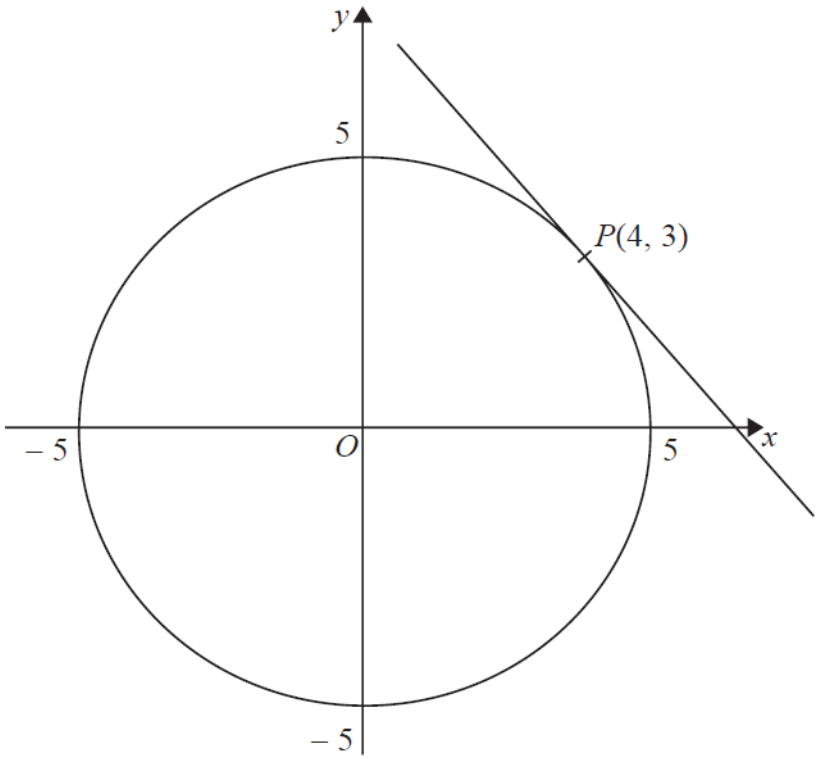
Point B has coordinates (16, 0)
Point P has coordinates $(3p, p)$

Find the value of p.
Give your answer correct to 1 decimal place.
You must show all your working.

$p =$ .....

(Total for Question 4 is 4 marks)

5 Here is a circle, centre O, and the tangent to the circle at the point $P(4, 3)$ on the circle.



Find an equation of the tangent at the point P.

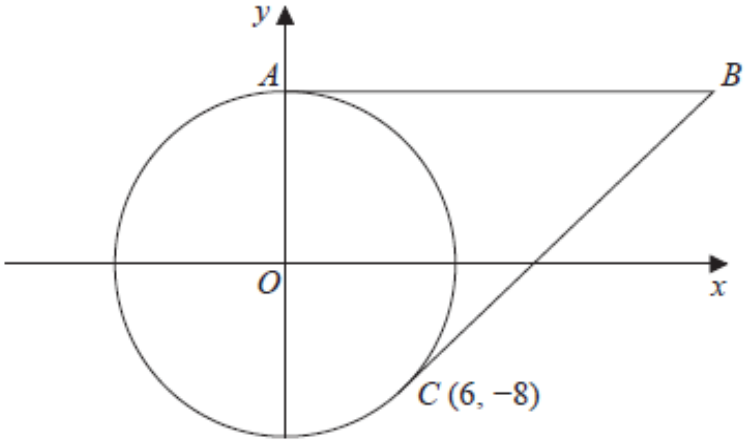
.....

(Total for Question 5 is 3 marks)

6 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 6 is 5 marks)

7



The diagram shows the circle with equation $x^2 + y^2 = 100$
The unit of length on both axes is one centimetre.

The circle intersects the positive y-axis at the point A.
The point C on the circle has coordinates $(6, -8)$
The straight lines AB and CB are tangents to the circle.

Find the area of quadrilateral $ABCO$.

..... cm^2

(Total for Question 7 is 4 marks)

8 The line l is a tangent to the circle $x^2 + y^2 = 40$ at the point A.
A is the point (2, 6).

The line l crosses the x-axis at the point P.

Work out the area of triangle OAP.

.....

(Total for Question 8 is 5 marks)

9 **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 9 is 3 marks)

TOTAL FOR PAPER IS 34 MARKS