AQA Level 2 Certificate
FURTHER MATHEMATICS

Level 2 (8365)

Worksheet 1
Coordinate Geometry Circles

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1 Coordinate Geometry - Circles

Question 1

Write down the equation of each of these circles.

(a) Centre (0, 3) radius 2 *(2 marks)*

(b) Centre (1, −5) radius 4 *(2 marks)*

(c) Centre (−3, 4) radius $\sqrt{7}$ *(2 marks)*

(d) Centre (8, 15) radius 17

Does this circle pass through the origin?

Show working to support your answer. *(4 marks)*

Question 2

Write down the centre and radius of each of these circles.

(a) $x^2 + y^2 = 36$ *(2 marks)*

(b) $(x - 3)^2 + (y - 4)^2 = 100$ *(2 marks)*

(c) $(x + 5)^2 + y^2 = 3$ *(2 marks)*
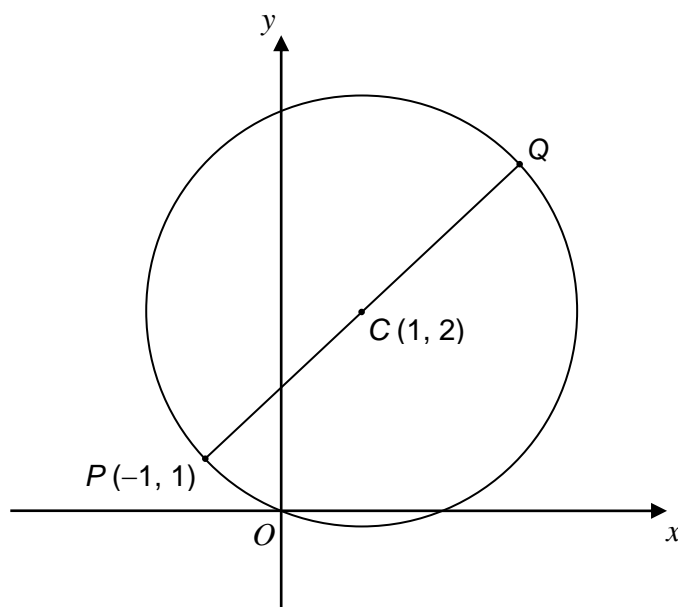
Question 3 (non-calculator)

AB is the diameter of a circle.

A is (−3, 6) and *B* is (5, 12).

Work out the equation of the circle. *(5 marks)*

PQ is a diameter of a circle, centre C.

Not drawn
accurately
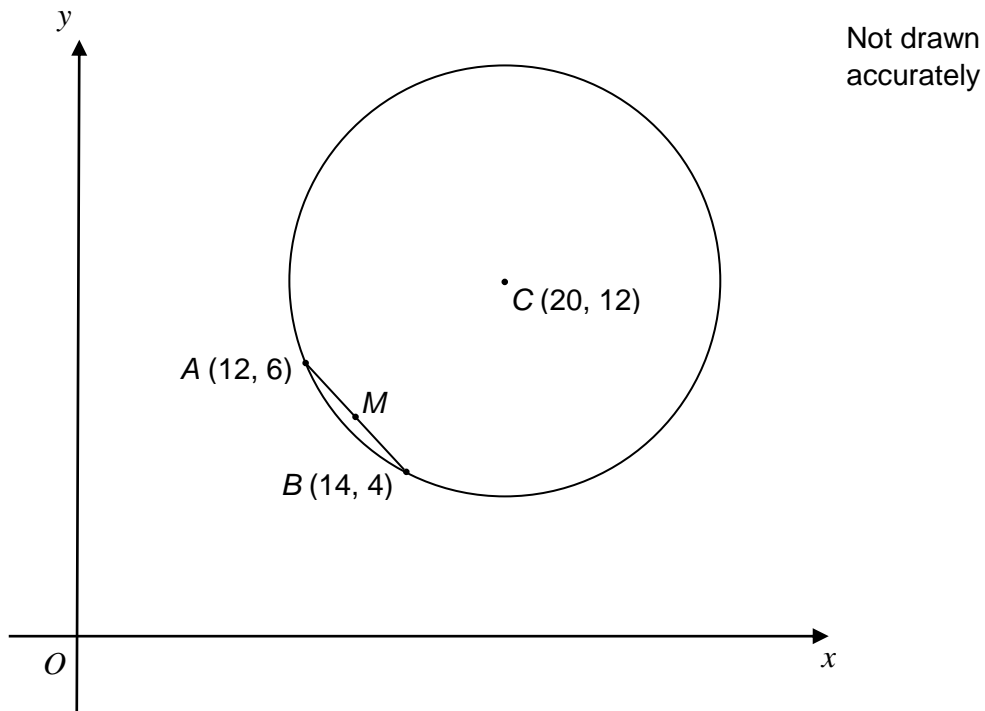
(a)   Work out the coordinates of Q.   *(1 mark)*

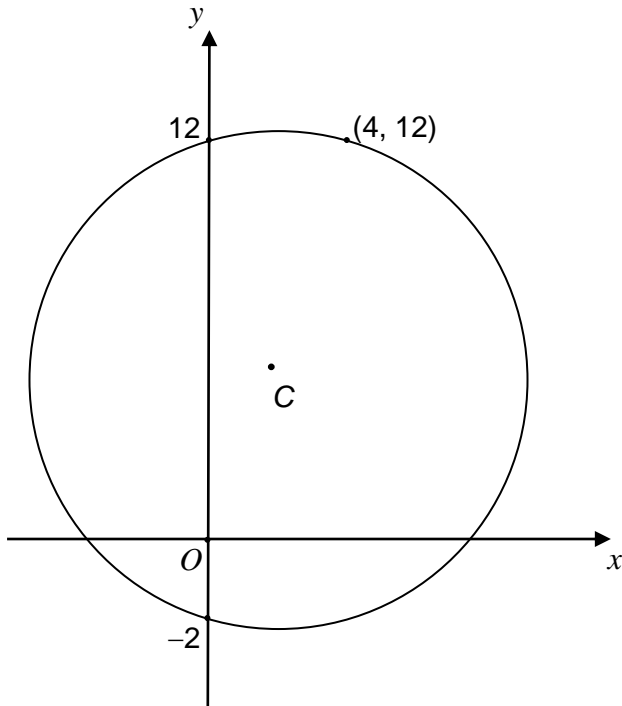(b)   Work out the equation of the circle.   *(3 marks)*

Question 5 (non-calculator)

A (12, 6) and *B* (14, 4) are two points on a circle, centre *C* (20, 12).

Not drawn
accurately

(a)   Work out the coordinates of the midpoint *M*, of *AB*.   *(2 marks)*

(b)   Show that the length $CM = 7\sqrt{2}$ (*3 marks*)

(c)   Work out the radius of the circle.   *(2 marks)*

Question 6

(0, −2), (0, 12) and (4, 12) are three points on a circle, centre *C*.

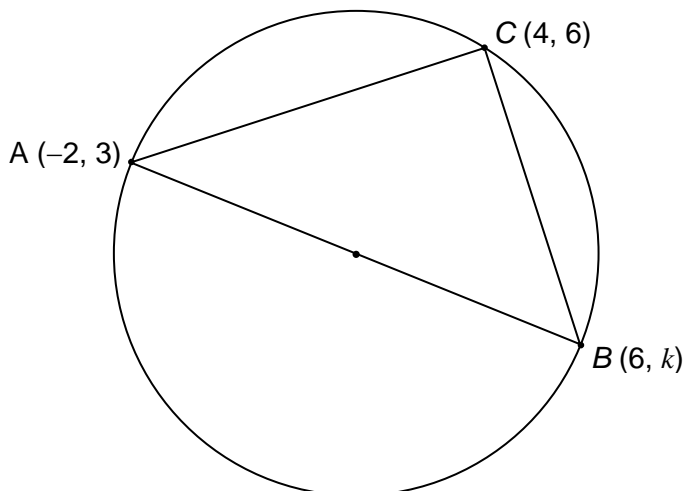Not drawn accurately

Work out the coordinates of *C*.   *(3 marks)*

Question 7

AB is a diameter of the circle *ABC*.

Not drawn accurately

Work out the value of k.   *(5 marks)*

Question 8

A circle has equation $(x - 5)^2 + (y - 4)^2 = 100$

Show that the point (13, −2) lies on the circle.   *(2 marks)*

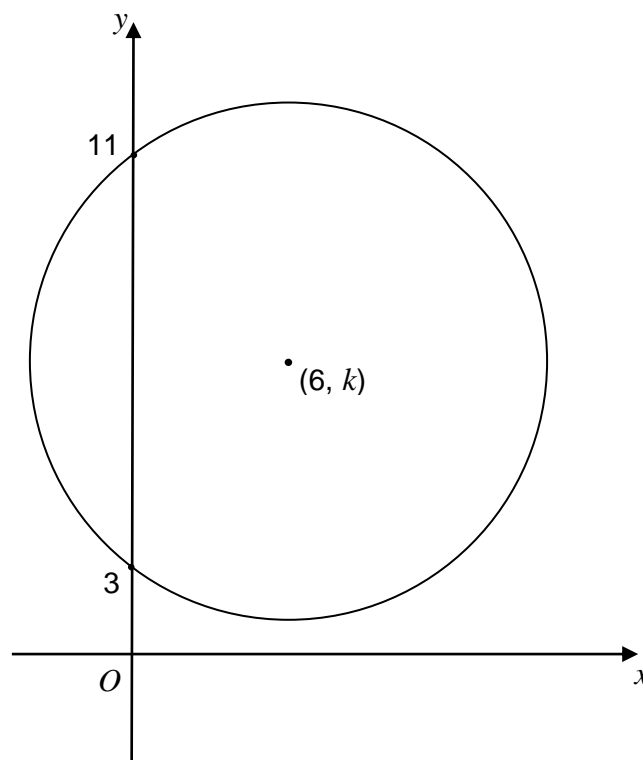## Question 9

The point (13, −2) lies on the circle $(x - a)^2 + (y - 4)^2 = 100$

Work out the two possible values of a.   *(5 marks)*

Question 10

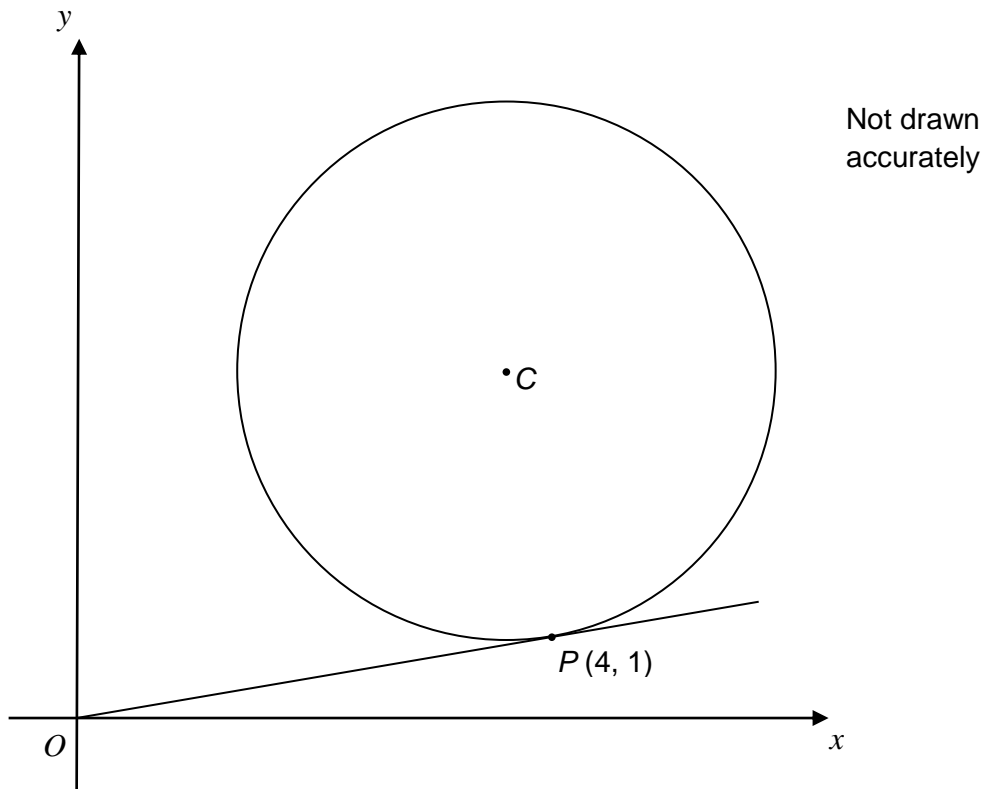A circle passes through the points (0, 3) and (0, 11) and has centre (6, k)

Not drawn accurately

(a)   Work out the value of k.

(b)   Hence find the equation of the circle.   *(5 marks)*

The equation of this circle, centre C, is $(x-3)^2 + (y-5)^2 = 17$

$P\,(4, 1)$ is a point on the circle.

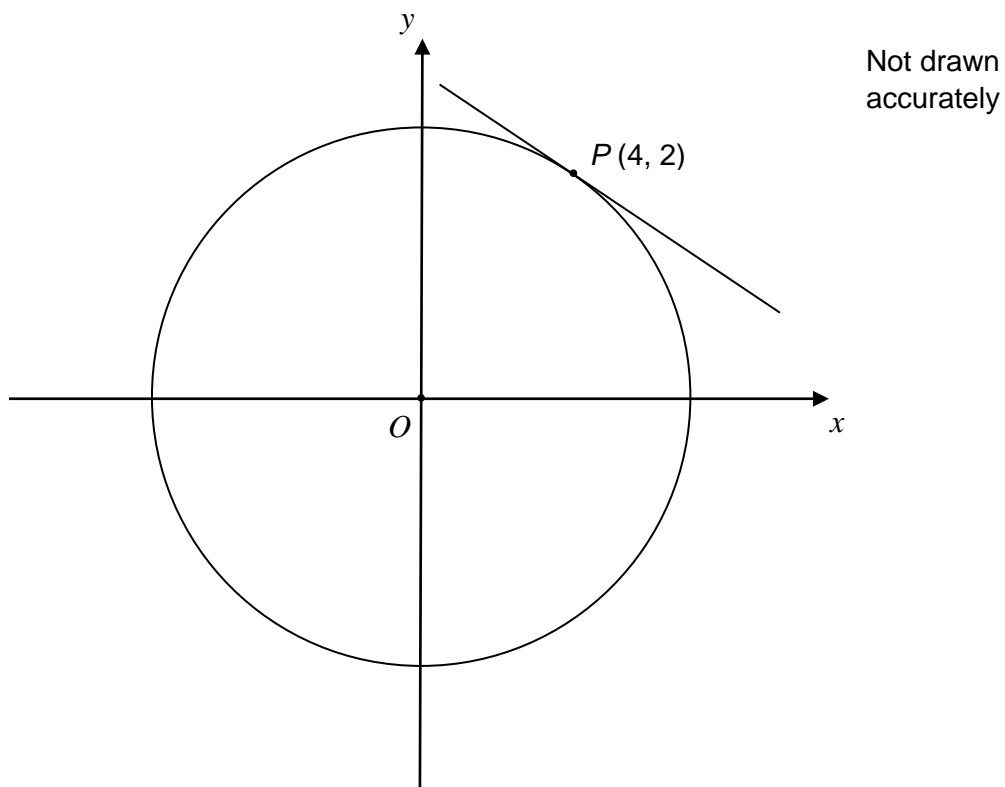Not drawn accurately

(a)   Show working to explain why OP is a tangent to the circle.   *(5 marks)*

(b)   Show that the length OP is equal to the radius of the circle.   (*3 marks*)

Question 12 (non-calculator)

The equation of this circle is $\quad x^2 + y^2 = 20$

$P\,(4, 2)$ is a point on the circle.

Not drawn accurately

Work out the equation of the tangent to the circle at P.

Give your answer in the form $y = mx + c$ $\hfill$ (*3 marks*)

Question 13

$A\,(-2, 5)$ and $B\,(4, 13)$ are points on a circle.

AB is a diameter.

(a)   Work out the equation of the circle.

$\hfill$ (*4 marks*)

(b)   Work out the equation of the tangent to the circle passing through A.

Give your answer in the form $\quad ax + by + c = 0$

$\hfill$ (*4 marks*)