

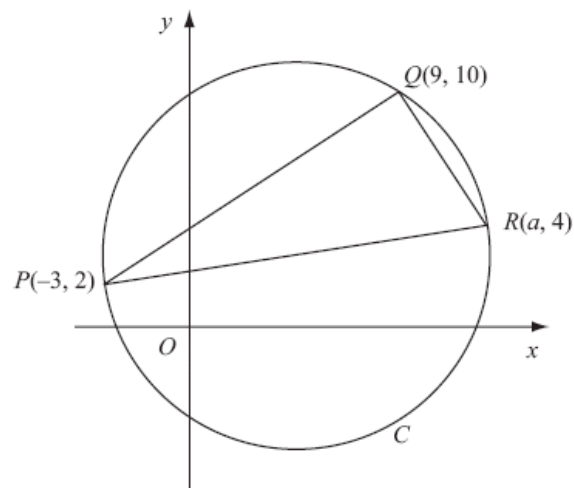
Year 1 Pure Chapter 6: Circles - Exam Questions Circles (Total Marks 57)

1. The line joining the points $(-1, 4)$ and $(3, 6)$ is a diameter of the circle C .

Find an equation for C .

(Total 6 marks)

2.



The points $P(-3, 2)$, $Q(9, 10)$ and $R(a, 4)$ lie on the circle C , as shown in the diagram above.

Given that PR is a diameter of C ,

(a) show that $a = 13$,

(3)

(b) find an equation for C .

(5)

(Total 8 marks)

3. The circle C , with centre at the point A , has equation $x^2 + y^2 - 10x + 9 = 0$.

Find

- (a) the coordinates of A , (2)
- (b) the radius of C , (2)
- (c) the coordinates of the points at which C crosses the x -axis. (2)

Given that the line l with gradient $\frac{7}{2}$ is a tangent to C , and that l touches C at the point T ,

- (d) find an equation of the line which passes through A and T .

(3)
(Total 9 marks)

4. The circle C has equation

$$x^2 + y^2 - 6x + 4y = 12$$

- (a) Find the centre and the radius of C .

(5)

The point $P(-1, 1)$ and the point $Q(7, -5)$ both lie on C .

- (b) Show that PQ is a diameter of C .

(2)

The point R lies on the positive y -axis and the angle $PRQ = 90^\circ$.

- (c) Find the coordinates of R .

(4)

(Total 11 marks)

5. The circle C has centre $A(2,1)$ and passes through the point $B(10, 7)$.

(a) Find an equation for C .

(4)

The line l_1 is the tangent to C at the point B .

(b) Find an equation for l_1 .

(4)

The line l_2 is parallel to l_1 and passes through the mid-point of AB .

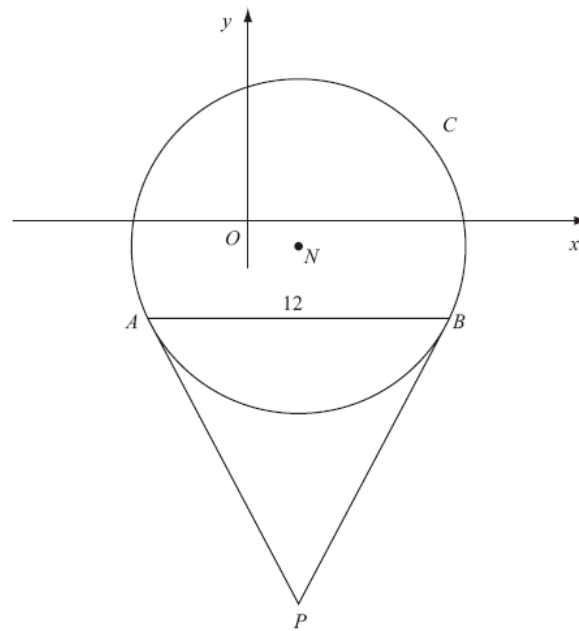
Given that l_2 intersects C at the points P and Q ,

(c) find the length of PQ , giving your answer in its simplest surd form.

(3)

(Total 11 marks)

6.



The diagram above shows a sketch of the circle C with centre N and equation

$$(x - 2)^2 + (y + 1)^2 = \frac{169}{4}$$

- (a) Write down the coordinates of N .

(2)

- (b) Find the radius of C .

(1)

The chord AB of C is parallel to the x -axis, lies below the x -axis and is of length 12 units as shown in the diagram above.

- (c) Find the coordinates of A and the coordinates of B .

(5)

- (d) Show that angle $ANB = 134.8^\circ$, to the nearest 0.1 of a degree.

(2)

The tangents to C at the points A and B meet at the point P .

- (e) Find the length AP , giving your answer to 3 significant figures.

(2)

(Total 12 marks)