

1 The circle C has the equation

$$x^2 + y^2 - 2x + 6y = 26.$$

(i) Find the coordinates of the centre of C .

(2)

(ii) Find the radius of C .

(1)

(Total for question 1 is 3 marks)

- 2** The circle C has centre $(2, 5)$ and passes through the point $(4, 9)$.
Find an equation for C .

(Total for question 2 is 3 marks)

3 The circle C has centre $(-2, 3)$ and passes through the point $(1, 8)$.

(a) Find an equation for C .

(4)

(b) Show that the point $(3, 6)$ lies on C .

(1)

(c) Find the equation of the tangent to C at $(3, 6)$.

Give your answer in the form $ax + by + c = 0$, where a , b and c are integers.

(5)

(Total for question 3 is 10 marks)

4 The circle C has centre $(2, 5)$ and radius 7.

(a) Find an equation for C .

(2)

(b) The line $y = 3x - 1$ intersects C at the points A and B .

Find the exact coordinates of A and B .

(6)

(Total for question 4 is 8 marks)

5 The circle C has the equation

$$x^2 + y^2 + 8x - 4y + k = 0,$$

where k is a constant. Given that the point $(1, 5)$ lies on C .

(a) Find the value of k .

(2)

(b) Find the coordinates of the centre and the radius of C .

(3)

- (c) A straight line that passes through the point $A(3, 7)$ is tangent to the circle C at the point B .

Find the exact length of the line AB .

(5)

(Total for question 5 is 10 marks)

6 The points D , E and F have coordinates $(-3, 2)$, $(4, -1)$ and $(1, -8)$ respectively.

(a) Show that angle DEF is a right angle.

(4)

(b) Given that D , E and F all lie on the circle C , find the coordinates of the centre of C .

(3)

(c) Find the equation of the circle C .

(3)

(Total for question 6 is 10 marks)

7 The circle C has the equation

$$x^2 + y^2 - 6x + 2y = 6.$$

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

(3)

- (b) C crosses the y -axis at the points A and B .

Find the coordinates of the points A and B .

(3)

(Total for question 7 is 6 marks)

- 8** The points A and B have coordinates $(-3, 5)$ and $(13, -4)$ respectively. Given that AB is a diameter of the circle C .
Find an equation for C .

(Total for question 8 is 6 marks)

9 The circle C has centre $(1, 5)$ and passes through the point $A(-4, 3)$.

(a) Find an equation for C .

(4)

(b) Find an equation for the tangent to C at A , giving your answer in the form $ax + by + c = 0$, where a , b and c are integers.

(4)

(Total for question 9 is 8 marks)

- 10** The circle C has centre $(5, k)$, where k is a constant. The line $y = 2x + 1$ is tangent to the circle C , touching C at the point $A(3, 7)$.
Find an equation for C .

(Total for question 10 is 5 marks)
