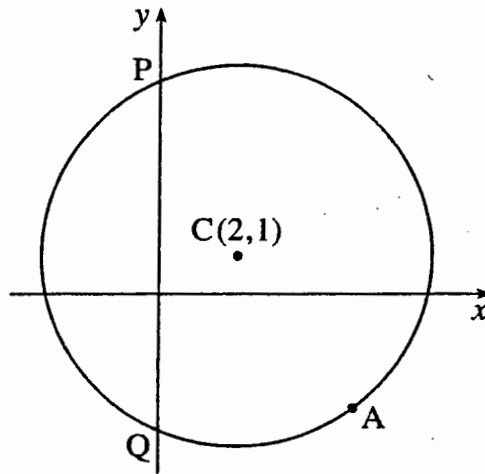


# Circles Homework October Half-Term

10



**Fig. 10**

Fig. 10 shows a circle with centre  $C(2, 1)$  and radius 5.

- (i) Show that the equation of the circle may be written as

$$x^2 + y^2 - 4x - 2y - 20 = 0. \quad [3]$$

- (ii) Find the coordinates of the points P and Q where the circle cuts the y-axis. Leave your answers in the form  $a \pm \sqrt{b}$ . [3]

- (iii) Verify that the point  $A(5, -3)$  lies on the circle.

Show that the tangent to the circle at A has equation  $4y = 3x - 27$ . [6]

- 11 The points  $A(0, 2)$ ,  $B(7, 9)$  and  $C(6, 10)$  lie on the circumference of a circle, as shown in Fig.11.

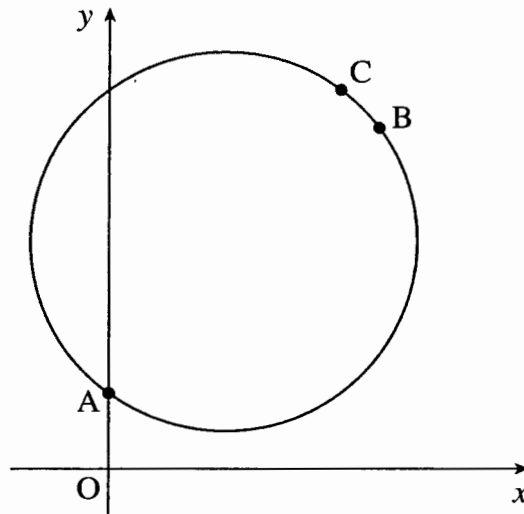


Fig. 11

- (i) Find the length of AC.

Prove that triangle ABC is right-angled at B.

[4]

- (ii) Hence show that the centre of the circle is  $(3, 6)$  and its radius is 5.

Find the equation of the circle.

[4]

- (iii) Find an equation for the tangent to the circle at C.

Find the coordinates of the points where this tangent crosses the axes.

[5]

**10** A circle has equation  $x^2 + y^2 = 45$ .

(i) State the centre and radius of this circle. [2]

(ii) The circle intersects the line with equation  $x + y = 3$  at two points, A and B. Find algebraically the coordinates of A and B.

Show that the distance AB is  $\sqrt{162}$ . [8]

**11** A(9, 8), B(5, 0) and C(3, 1) are three points.

(i) Show that AB and BC are perpendicular. [3]

(ii) Find the equation of the circle with AC as diameter. You need not simplify your answer.

Show that B lies on this circle. [6]

(iii) BD is a diameter of the circle. Find the coordinates of D. [3]