

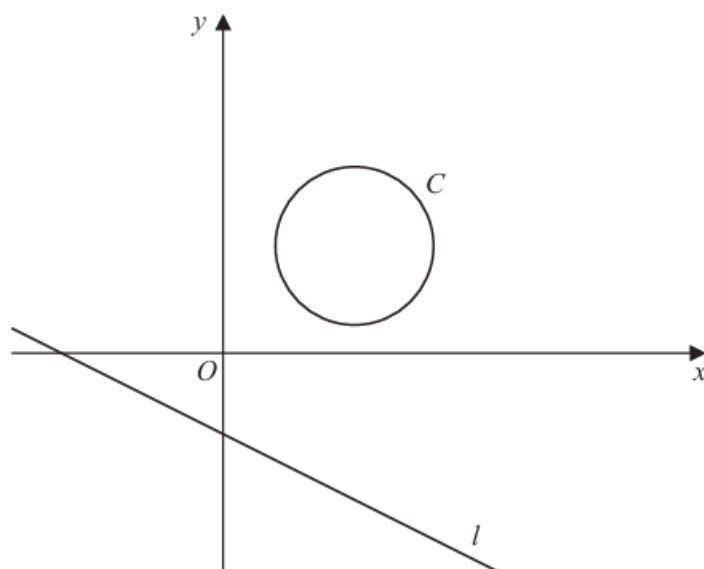
Question 5**Figure 3**

Figure 3 shows the circle C with equation

$$x^2 + y^2 - 10x - 8y + 32 = 0$$

and the line l with equation

$$2y + x + 6 = 0$$

(a) Find

- (i) the coordinates of the centre of C ,
- (ii) the radius of C .

(3)

(b) Find the shortest distance between C and l .

(5)

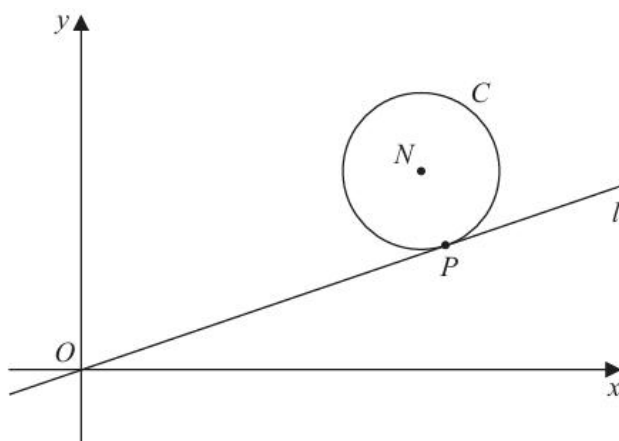
Question 6**Figure 4**

Figure 4 shows a sketch of a circle C with centre $N(7, 4)$

The line l with equation $y = \frac{1}{3}x$ is a tangent to C at the point P .

Find

(a) the equation of line PN in the form $y = mx + c$, where m and c are constants, (2)

(b) an equation for C . (4)

The line with equation $y = \frac{1}{3}x + k$, where k is a non-zero constant, is also a tangent to C .

(c) Find the value of k . (3)
