Leave blank

5. The circle C has equation

$$x^2 + y^2 - 20x - 24y + 195 = 0$$

The centre of C is at the point M.

(a) Find

    (i) the coordinates of the point M,

    (ii) the radius of the circle C.

(5)

N is the point with coordinates $(25, 32)$.

(b) Find the length of the line MN.

(2)

The tangent to C at a point P on the circle passes through point N.

(c) Find the length of the line NP.

(2)

a)

$$x^2 + y^2 - 20x - 24y + 195 = 0$$

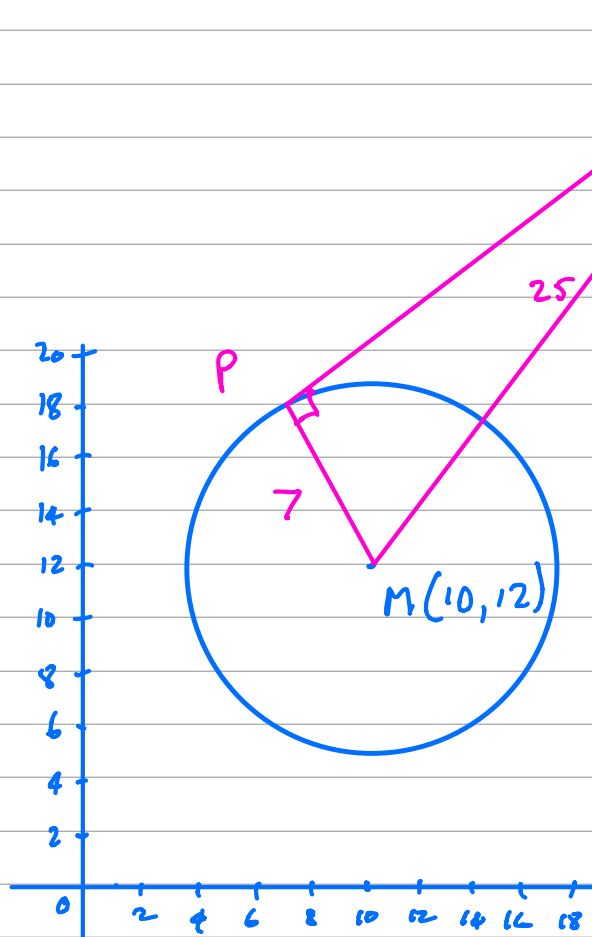$$(x-10)^2 - 100 + (y-12)^2 - 144 + 195 = 0$$

$$(x-10)^2 + (y-12)^2 - 49 = 0$$

$$(x-10)^2 + (y-12)^2 = 7^2$$

i) Centre $M(10, 12)$

ii) Radius $= 7$

Question 5 continued

$N(25, 32)$

P

25

7

$M(10, 12)$

b) Find MN

$$MN = \sqrt{(25-10)^2 + (32-12)^2}$$

$$= \sqrt{15^2 + 20^2}$$

$$= 25$$

c) Find NP

$$PN^2 + 7^2 = 25^2$$

$$PN^2 = 625 - 49$$

$$PN^2 = 576$$

$$PN = \sqrt{576}$$

$$PN = 24$$

Question 5 continued