

NCERT Exemplar Solutions by Dev Anoop (Bathinda), Ex. 7.3

(13)

$P(a, b)$

$\overline{A(10, 6) \quad B(k, 4)}$

$P(a, b)$  is midpoint of  $AB$

$$\therefore a = \frac{10+k}{2} \quad b = \frac{-6+4}{2}$$

$$\dots \textcircled{1} \quad = \frac{-2}{2}$$

$$\quad \quad \quad = -1 \quad \dots \textcircled{11}$$

$a - 2b = 18$  (given)

$$\frac{10+k}{2} - 2 \times (-1) = 18 \quad \text{[using } \textcircled{1}, \textcircled{11}]$$

$$\frac{10+k}{2} = 18 - 2$$

$$\Rightarrow 10+k = 32$$

$$\Rightarrow k = 22$$

$$AB = \sqrt{(22-10)^2 + (4-6)^2}$$

$$= \sqrt{12^2 + 10^2}$$

$$= \sqrt{144 + 100}$$

$$= \sqrt{244}$$

$$= 2\sqrt{61} \text{ units}$$

(14)

$C(2a, a-7)$

$r = \frac{10\sqrt{2}}{2} = 5\sqrt{2} \text{ cm}$

$P(11, -9)$

$$CP = \sqrt{(11-2a)^2 + (-9-a+7)^2}$$

$$5\sqrt{2} = \sqrt{121 + 4a^2 - 44a + 4 + a^2 + 4a}$$

$$5\sqrt{2} = \sqrt{5a^2 - 40a + 125}$$

Squaring both sides

$$25 \times 2 = 5a^2 - 40a + 125$$

$$\Rightarrow 5a^2 - 40a + 75 = 0$$

( $\div 5$ )

$$a^2 - 8a + 15 = 0$$

$$\Rightarrow a^2 - 5a - 3a + 15 = 0$$

$$\Rightarrow a(a-5) - 3(a-5) = 0$$

$$\Rightarrow (a-5)(a-3) = 0$$

$$\Rightarrow a-5=0, a-3=0$$

$$\Rightarrow a=5, a=3$$