

Q5.  $A(3, 4)$ ,  $B(6, 7)$ ,  $C(9, 4)$  &  $D(6, 1)$ .

$$AB = \sqrt{(6-3)^2 + (7-4)^2} = \sqrt{18} = 3\sqrt{2}.$$

$$BC = \sqrt{(9-6)^2 + (4-7)^2} = \sqrt{18} = 3\sqrt{2}$$

$$CD = \sqrt{(9-6)^2 + (4-4)^2} = \sqrt{18} = 3\sqrt{2}$$

$$DA = \sqrt{(3-6)^2 + (4-1)^2} = \sqrt{18} = 3\sqrt{2}.$$

$$\text{Diagonal } AC = \sqrt{(9-3)^2 + (4-4)^2}.$$

$$= \sqrt{(6)^2 + (0)^2} = \sqrt{36} = 6.$$

$$BD = \sqrt{(6-0)^2 + (1-7)^2}.$$

$$\therefore AB = BC = CD = DA = 3\sqrt{2}.$$

$$AC = BD = 6.$$

$$= \sqrt{(0)^2 + (-6)^2} = \sqrt{36} = 6.$$

Q6. (i)  $A(1, -2)$ .

$B(1, 0)$ .

$C(-1, 2)$ .

$D(-3, 0)$ .

$$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$AB = \sqrt{(1+1)^2 + (0+2)^2} = \sqrt{4+4} = \sqrt{8} = 2\sqrt{2}$$

$$BC = \sqrt{(-1-1)^2 + (2-0)^2} = \sqrt{4+4} = \sqrt{8} = 2\sqrt{2}.$$

$$AC = BD.$$

$$AB = BC = CD = AD.$$

$$CD = \sqrt{(-3+1)^2 + (0-2)^2} = \sqrt{4+4} = \sqrt{8} = 2\sqrt{2}.$$

$$AD = \sqrt{(-3+1)^2 + (0+2)^2} = \sqrt{4+4} = \sqrt{8} = 2\sqrt{2}.$$

$$AC = \sqrt{(-1+1)^2 + (2+2)^2} = \sqrt{0+16} = \sqrt{16} = 4.$$

$$BD = \sqrt{(-3-1)^2 + (0-0)^2} = \sqrt{16+0} = \sqrt{16} = 4.$$

$$C = (0, 3)$$

$$D = (-1, -4)$$

$$AB = \sqrt{(3+3)^2 + (1-5)^2} = \sqrt{36+16} = \sqrt{52} = 2\sqrt{13}$$

$$BC = \sqrt{(0-3)^2 + (3-1)^2} = \sqrt{9+4} = \sqrt{13}$$

$$CD = \sqrt{(-1-0)^2 + (-4-3)^2} = \sqrt{1+49} = 5\sqrt{2}$$

$$AD = \sqrt{(-3+1)^2 + (5+4)^2} = \sqrt{4+81} = \sqrt{85}$$

(iii)  $A(4, 5)$

$$B(7, 6)$$

$$C(4, 3)$$

$$D(1, 2)$$

$$AB = \sqrt{(7-4)^2 + (6-5)^2} = \sqrt{9+1} = \sqrt{10}$$

$$BC = \sqrt{(4-7)^2 + (3-6)^2} = \sqrt{9+9} = 3\sqrt{2}$$

$$CD = \sqrt{(1-4)^2 + (2-3)^2} = \sqrt{9+1} = \sqrt{10}$$

$$AD = \sqrt{(1-4)^2 + (2-5)^2} = \sqrt{9+9} = 3\sqrt{2}$$

$$AC = \sqrt{(4-4)^2 + (3-5)^2} = \sqrt{4} = 2$$

$$BD = \sqrt{(1-7)^2 + (2-6)^2} = \sqrt{36+16} = \sqrt{52} = 2\sqrt{13}$$

$$AB = CD, BC = AD$$

$$AC \neq BD$$

07.  $A(2, -5)$ .

$B(-2, 9)$

$PA = PB$

$PA^2 = PB^2$

$\rightarrow (x-2)^2 + (0+5)^2 = (x+2)^2 + (0-9)^2$

$\rightarrow (x-2)^2 - (x+2)^2 = 81 - 25$

$\rightarrow (x-2+x+2)(x-2-x-2) = 56$

$\rightarrow (2x)(-4) = 56$

$\rightarrow -8x = 56$

$\rightarrow x = -7$

$(-7, 0)$

08.  $P(2, -3)$

$Q(10, y)$

$PQ = 10 \text{ units}$

$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} = PQ \Rightarrow \sqrt{(10-2)^2 + (y+3)^2} = 10$

$= 64 + y^2 + 9 + 6y = 100 \Rightarrow y^2 + 6y + 73 - 100 = 0$

$= y^2 + 6y - 27 = 0 \Rightarrow y^2 + 9y - 3y - 27 = 0$

$= y(y+9) - 3(y+9) = 0 \Rightarrow (y-3)(y+9) = 0$

$= y = 3 = 0$

$= y = 3$

or  $-9$

09.  $P(0, 1)$

$Q(5, -3)$

$R(x, 6)$

$\therefore QR = PR \Rightarrow QR^2 = PR^2$

$= (5-0)^2 + (-3-1)^2 = (x-0)^2 + (6-1)^2$

$= 25 + 16 = x^2 + 25$

$= x^2 - 16 \Rightarrow x = \pm 4$

$QR = \sqrt{(x-0)^2 + (6-1)^2} = \sqrt{x^2 + 25}$

Q9.  $\sqrt{(4)^2 + 5^2} = \sqrt{16 + 25} = \sqrt{41}$ .

$$PR = \sqrt{(x-5)^2 + (6+3)^2}$$

$$= \sqrt{(4-5)^2 + (6+3)^2}$$

$$= \sqrt{(-1)^2 + (9)^2} = \sqrt{1+81} = \sqrt{82}$$

Also  $PR = \sqrt{(-4-5)^2 + (6+3)^2}$

$$= \sqrt{(-9)^2 + (9)^2} = \sqrt{162} = 9\sqrt{2}$$

$$QR = \sqrt{41}$$

$$PR = \sqrt{82}$$

$$9\sqrt{2}$$

Q10.  $A(3, 6)$

$$B(-3, 4)$$

$$P(x, y)$$

$$AP = BP \Rightarrow \sqrt{(x-3)^2 + (y-6)^2} = \sqrt{(x+3)^2 + (y-4)^2}$$

$$\Rightarrow (x-3)^2 + (y-6)^2 = (x+3)^2 + (y-4)^2$$

$$\Rightarrow x^2 + 9 - 6x + y^2 + 36 - 12y = x^2 + 9 + 6x + y^2 + 16 - 8y$$

$$\Rightarrow -6x - 6x - 12y + 8y + 45 - 25 = 0 \Rightarrow 12x - 4y + 20 = 0$$

$$\Rightarrow -4, \text{ we get } 3x + y - 5 = 0$$