5. A(3,4) B(6,7) C(9,4) D(6,1)

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

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

$= \sqrt{9+9} = \sqrt{18}$

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

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

$= \sqrt{9+9} = \sqrt{18}$

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

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

$= \sqrt{9+9} = \sqrt{18}$

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

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

$= \sqrt{9+9} = \sqrt{18}$

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

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

$= \sqrt{36} = 6$

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

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

$= \sqrt{36} = 6$

As, AB = BC = CD = DA sides are equal and digonal AC = BD are equal Hence, it is a square.

6. (i) A(-1,-2), B(1,0), C(-1,2), D(-3,0)

$AB = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$
$= \sqrt{(1--1)^2+(0+2)^2}$
$= \sqrt{4+4} = \sqrt{8}$

$BC = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$
$= \sqrt{(-1-1)^2+(2-0)^2}$
$= \sqrt{4+4} = \sqrt{8}$

$CD = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$
$= \sqrt{(-3--1)^2+(0-2)^2}$
$= \sqrt{4+4} = \sqrt{8}$

$AD = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$
$= \sqrt{(-3-1)^2+(0--2)^2}$
$= \sqrt{4+4} = \sqrt{8}$

It is a square.

(ii) A(-3,5), B(3,1), C(0,3), D(-1,-4)

$AB = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$
$= \sqrt{(3--3)^2+(1-5)^2}$
$= \sqrt{36+16} = \sqrt{52}$

$BC = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$
$= \sqrt{(0-3)^2+(3-1)^2}$
$= \sqrt{9+4} = \sqrt{13}$

$BD = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$
$= \sqrt{(-1-0)^2+(-4-3)^2}$
$= \sqrt{1+49} = \sqrt{50}$

$AD = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$
$= \sqrt{(-1--3)^2+(-4-5)^2}$
$= \sqrt{4+81} = \sqrt{85}$

As, no side are equal, hence it is no a quadrilateral

(iii) $AB = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$
$= \sqrt{9+1} = \sqrt{10}$

$CD = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$
$= \sqrt{9+1} = \sqrt{10}$

$BC = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$
$= \sqrt{9+9} = \sqrt{18}$

$AD = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$
$= \sqrt{9+9} = \sqrt{18}$

As, Opposite sides are equal, hence it is a parallelogram

7. A(2,-5) B(-2,9)
let C be (x,0)

$AC = \sqrt{(x_2-x_1)^2-(y_2-y_1)^2}$
$= \sqrt{(x-2)^2-(0+5)^2}$
$\Rightarrow x^2+4-4x+25$
$\Rightarrow x^2+4x+29$

$BC = \sqrt{(x_2-x_1)^2-(y_2-y_1)^2}$
$= \sqrt{(x+2)^2-(0-9)^2}$
$\Rightarrow x^2+4+4x+81$
$\Rightarrow x^2+4x+85$

$\Rightarrow -4x+29 = 4x+85$
$\Rightarrow -8x = 56$
$x = -7$
P = (-7,0) is the point on x axis

8. P(2,-3) Q(10,y)
let R be (0,y)

$PR = \sqrt{(x_2-x_1)+(y_2-y_1)}$
$= \sqrt{4+(y+3)^2}$
$= y^2+9+6y+4$
$\Rightarrow y^2+6y+13$

$QR = \sqrt{(x_2-x_1)+(y_2-y_1)}$
$= \sqrt{100+}$

$\Rightarrow \sqrt{(x_2-x_1)^2+(y_2-y_1)^2} = 10$
$\Rightarrow \sqrt{64+(y+3)^2}^2-(10)^2$
$\Rightarrow 64+y^2+9+6y = 100$
$\Rightarrow y^2+6y-100-73 = 27$
$\Rightarrow y^2+6y-27 = 0$
$\Rightarrow y^2+3y+9y-27$
$\Rightarrow y(y-3)+9(y-3)$
$\Rightarrow y = 3, -9$

10 A(3,6) B(-3,4) P(x,y)

AP = BP

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

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

$\Rightarrow \sqrt{x^2+9-6x+y^2+36-12x} \Rightarrow \sqrt{x^2+9+6x+y^2+16-8y}$

$\Rightarrow x^2 - 6x - 6x - 12y + 8y + 45 - 25 = 0$

$\Rightarrow -12x - 4y + 20 = 0$

$3x + y - 5 = 0$

9. Q(0,1) P(5,-3) R(x,6)

AS QR = PR

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

$\Rightarrow \sqrt{(0-5)^2+(-3-1)^2} = \Rightarrow \sqrt{(x-0)^2+(6-1)^2}$

$\Rightarrow (25+16) = \Rightarrow x^2+25$

$\Rightarrow x^2 = 16$

$x = 4$

$QR = \sqrt{(x-0)^2+(6-1)^2} = \sqrt{(x)^2+25} = \sqrt{(4)^2+25} = \sqrt{16+25} = \sqrt{41}$

$PR = \sqrt{(x-5)^2+(6+3)^2} = \sqrt{(-1)^2+(9)^2} = \sqrt{1+81} = \sqrt{82}$

$QR = \sqrt{41}$ $PR = \sqrt{82}$