5. $AB = \sqrt{(6-3)^2+(7-4)^2} = \sqrt{9+9} = 3\sqrt{2}$
$BC = \sqrt{(9-6)^2+(4-7)^2} = \sqrt{9+9} = 3\sqrt{2}$
$CD = \sqrt{(6-9)^2+(1-4)^2} = \sqrt{9+9} = 3\sqrt{2}$
$DA = \sqrt{(6-3)^2+(1-4)^2} = \sqrt{9+9} = 3\sqrt{2}$
$\because$ $AB = BC = CD = DA = 3\sqrt{2}$.
$\therefore$ ABCD is a square and Champa is correct.

6. i) $AB = \sqrt{(1+1)^2+(0+2)^2} = \sqrt{4+4} = 2\sqrt{2}$
$BC = \sqrt{(-1-1)^2+(2-0)^2} = \sqrt{4+4} = 2\sqrt{2}$
$CD = \sqrt{(-3+1)^2+(0-2)^2} = \sqrt{4+4} = 2\sqrt{2}$
$DA = \sqrt{(-3+1)^2+(0-2)^2} = \sqrt{4+4} = 2\sqrt{2}$
$AC = \sqrt{(-1+1)^2+(2+2)^2} = \sqrt{0+16} = 4$
$BD = \sqrt{(-3-1)^2+(0-0)^2} = \sqrt{16+0} = 4$
$\because$ $AB = BC = CD = DA = 2\sqrt{2}$
$\because$ $AC = BD = 4$
$\therefore$ The given points are the vertices of a square.

ii) $AB = \sqrt{(-3-3)^2+(1-5)^2} = \sqrt{36+16} = 2\sqrt{13}$
$BC = \sqrt{(0-3)^2+(3-1)^2} = \sqrt{9+4} = \sqrt{13}$
$CD = \sqrt{(-1-0)^2+(-4-3)^2} = \sqrt{1+49} = 5\sqrt{2}$
$DA = \sqrt{(-1+3)^2+(-4-5)^2} = \sqrt{4+81} = \sqrt{85}$

$\therefore$ The given point cannot form a general quadrilateral.

iii) $AB = \sqrt{(7-4)^2+(6-5)^2} = \sqrt{9+1} = \sqrt{10}$
$BC = \sqrt{(4-7)^2+(3-6)^2} = \sqrt{9+9} = \sqrt{18}$
$CD = \sqrt{(1-4)^2+(2-3)^2} = \sqrt{9+1} = \sqrt{10}$
$DA = \sqrt{(1-4)^2+(2-5)^2} = \sqrt{9+9} = \sqrt{18}$
$AC = \sqrt{(4-4)^2+(3-5)^2} = \sqrt{0+4} = 2$
$BD = \sqrt{(1-7)^2+(2-6)^2} = \sqrt{36+16} = 2\sqrt{13}$
$\because$ $AB = CD$ and $BC = DA$.
$\therefore$ The given points are the vertices of parallelogram.

7. $A = (x, 0)$; $B = (2, -5)$; $C = (-2, 9)$.
$AB = \sqrt{(2-x)^2+(-5-0)^2} = \sqrt{(2-x)^2+25}$
$AC = \sqrt{(-2-x)^2+(9-0)^2} = \sqrt{(-2-x)^2+81}$

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$\because$ AB = AC.

$\sqrt{(2-x)^2+25} = \sqrt{(-2-x)^2+81}$

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

$x^2+4-4x+25 = x^2+4+4x+81$

$8x = 25-81 = -56$

$\because x = -7$

$\because$ The point is $(-7, 0)$.

8. $PQ = \sqrt{(10-2)^2+(y+3)^2} = \sqrt{(8)^2+(y+3)^2}$

Since PQ = 10,

$\sqrt{(8)^2+(y+3)^2} = 10$

Squaring both the sides,

$64+(y+3)^2 = 100$

$(y+3)^2 = 100-64 = 36$

$y+3 = \pm 6$

$y+3 = 6$ or $y+3 = -6$

$\because y = 3$ or $-9$.

9. $PQ = \sqrt{(5-0)^2+(-3-1)^2} = \sqrt{(5)^2+(-4)^2} = \sqrt{25+16} = \sqrt{41}$

$QR = \sqrt{(0-x)^2+(1-6)^2} = \sqrt{(-x)^2+(-5)^2} = \sqrt{x^2+25}$

$\because PQ = QR$

$\because \sqrt{41} = \sqrt{x^2+25}$

Squaring both the sides,

$41 = x^2+25$

$x^2 = 16$

$x = \pm 4$

$x = 4$ or $-4$.

If R(4, 6) the QR and PR will be,

$QR = \sqrt{(0-4)^2+(1-6)^2} = \sqrt{(4)^2+(-5)^2} = \sqrt{16+25} = \sqrt{41}$

$PR = \sqrt{(5-4)^2+(-3-6)^2} = \sqrt{(1)^2+(9)^2} = \sqrt{1+81} = \sqrt{82}$

If R(-4, 6) then QR and PR will be,

$QR = \sqrt{(0+4)^2+(1-6)^2} = \sqrt{(4)^2+(-5)^2} = \sqrt{16+25} = \sqrt{41}$

$PR = \sqrt{(5+4)^2+(-3-6)^2} = \sqrt{(9)^2+(9)^2} = \sqrt{81+18} = 9\sqrt{2}$

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10. Point $(x, y)$ is equidistant from $(3, 6)$ and $(-3, 4)$.

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

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

Squaring both sides,

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

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

$36-16 = 6x+6x+12y-8y$

$20 = 12x+4y$

$3x+y = 5$

$3x+y-5 = 0$.