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

when point R is $(-4, 6)$

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

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

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

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

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

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

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

$\Rightarrow 20 = 12x+4y$

$\Rightarrow 3x+y-5 = 0$

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istance between $(x, 0)$ & $(-2, 9)$

$\Rightarrow \sqrt{(x-(-2))^2+(0-(-9))^2} = \sqrt{(x+2)^2+(9)^2}$

By the given conditions these distances are eq in measures

$\Rightarrow \sqrt{(x-2)^2+(5)^2} = \sqrt{(x+2)^2+(9)^2}$

$\Rightarrow (x-2)^2+24 = (x+2)^2+81$

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

$\Rightarrow 8x = -56$

$\Rightarrow x = -7$ $\therefore$ the point is $(-7, 0)$

It is given that the distance between $(2, -3)$ & $(10, y)$ is $10$

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

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

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

$\Rightarrow (y+3)^2 = 36$

$\Rightarrow (y+3)^2 = 36$

$\Rightarrow (y+3) = \pm 6$

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

Therefore $y = 3$ or $-9$

$PQ = QR$

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

$\Rightarrow \sqrt{(5)^2+(-4)^2} = \sqrt{(-x)^2+(-5)^2}$

$\Rightarrow \sqrt{25+16} = \sqrt{x^2+25}$

$AB = \sqrt{(-3-3)^2 + (5+1)^2} = \sqrt{(-6)^2 + (4)^2} = \sqrt{32+16} = \sqrt{52} = 2\sqrt{13}$

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

$CD = \cancel{\sqrt{(0-1)}}\ \sqrt{(0-(-1))^2 + (3-(-4))^2} = \sqrt{(1)^2 + (7)^2} = \sqrt{1+49} = \sqrt{50} = 5\sqrt{2}$

$AD = \sqrt{(-3-(-1))^2 + (5-(-4))^2} = \sqrt{(-2)^2 + (9)^2} = \sqrt{4+81} = \sqrt{85}$

It can be observed that all sides of this quadrilateral are of different lengths. Therefore, it can be said that it is only a general quadrilateral & not specific such as square, rectangle etc.

Let the points (4,5), (7,6), (4,3) & (1,2) be representing the vertices A B C D of the given quadrilateral respectively.

$AB = \sqrt{(4-7)^2 + (5-6)^2} = \sqrt{(-3)^2 + (-1)^2} = \sqrt{9+1} = \sqrt{10}$

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

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

$AD = \sqrt{(4-1)^2 + (5-2)^2} = \sqrt{(3)^2 + (3)^2} = \sqrt{9+9} = \sqrt{18}$

Diagonal $AC = \sqrt{(4-4)^2 + (5-3)^2} = \sqrt{(0)^2 + (2)^2} = \sqrt{0+4} = 2$

Diagonal $CD = \sqrt{(7-1)^2 + (6-2)^2} = \sqrt{(6)^2 + (4)^2} = \sqrt{36+16} = \sqrt{52} = 13\sqrt{2}$

It can be observed that opposite sides of this quadrilateral are of the same length. However the diagonals are of different lengths. Therefore the given points are the vertices of a parallelogram.

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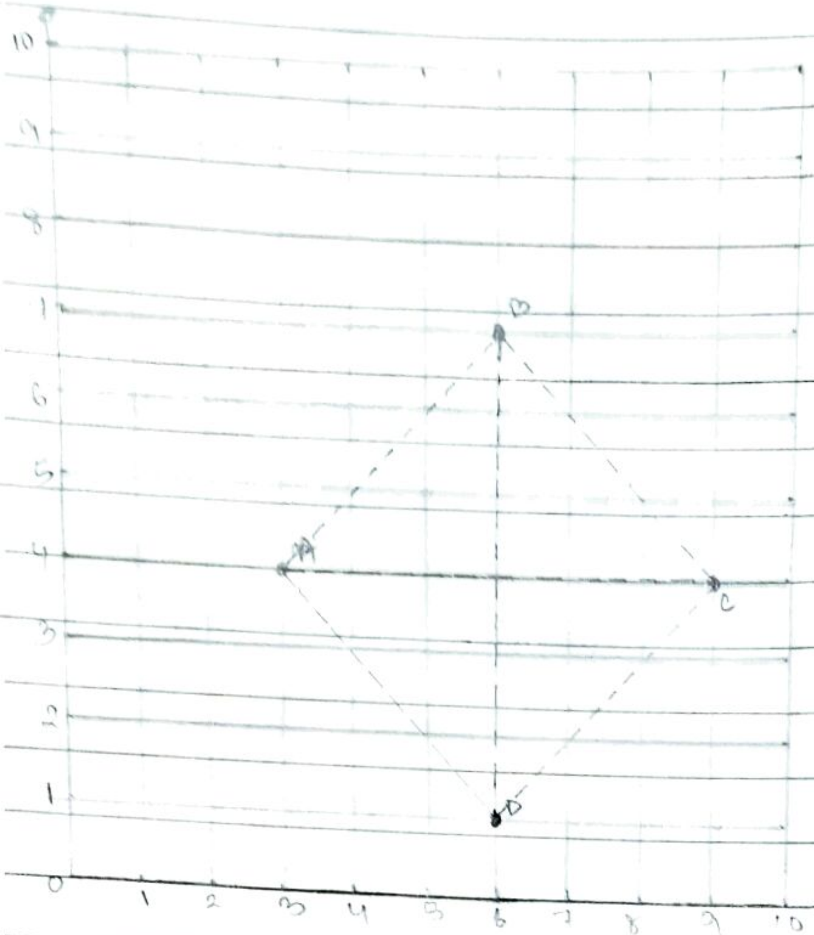


∴ Therefore, ABC[D] is a square & hen[ce] champa was corre[ct]

i) let the point (-1,-2), (1,0), (-1,2) & (-3,0) be the respective ~~abc~~ vertices A, B, C & D of the given quadrilateral respectively.

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

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

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

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

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

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

It can be observed that all sides of this quadrilater[al] are of the same length & also, the diagonals are of the same length. Therefore the given points are the vertices of a square.

ii) let the points (-3,5), (3,1), (0,3) & (-1,-4) be respective vertices ABCD of the given quadrilatera[l] respectively.

It can be observed that A(3,4), B (6,7), C (9,4) & D(6,1) are the position of these 4 friends

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

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

$\Rightarrow CD = 9-6 + 4-1 = 3 + 3 = 9+9 = 18 = 3$

$\Rightarrow AD = \sqrt{(3-6)^2+(4-1)^2} = \sqrt{(-3)^2+(3)^2} = \sqrt{9+9} = \sqrt{18} = 3\sqrt{2}$

Diagonal $AC = \sqrt{(3-9)^2+(4-4)^2} = \sqrt{(-6)^2+0^2} = 6$

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

$\Rightarrow$ It can be observed that all sides of this quadrilateral ABCD are of the same length & also the diagonals are of the same length