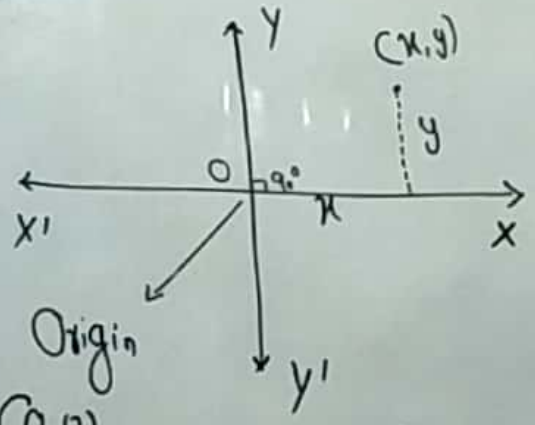
Cordinate Geometry

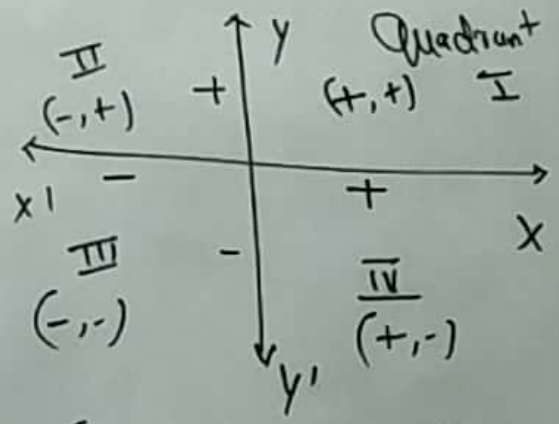


$x \rightarrow$ abcissa

$y \rightarrow$ Ordinate

Any point on X-axis = $(a, 0)$

. . . Y-axis = $(0, b)$



$(2, -3) \rightarrow$ IV th

$(-2, 3) \rightarrow$ II nd

① Distance formula

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

1(i) $(2,3)$ d $(4,1)$ — x_1, y_1 and x_2, y_2

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

Ex → 7.1

③

A $(1,5)$ B $(2,3)$ C $(-2,-11)$

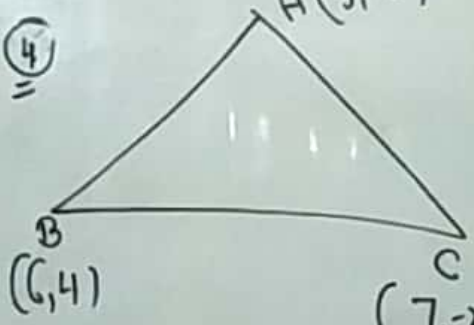
$$AB = \sqrt{(2-1)^2 + (3-5)^2}$$
$$= \sqrt{1+4} = \sqrt{5}$$

$$BC = \sqrt{(2+2)^2 + (3+11)^2} = \sqrt{16+196} = \sqrt{212}$$

$$AC = \sqrt{(1+2)^2 + (5+11)^2}$$
$$= \sqrt{9+256} = \sqrt{265}$$

$AB + BC \neq AC$ Not Collinear

④



$AB = BC$ Isosceles

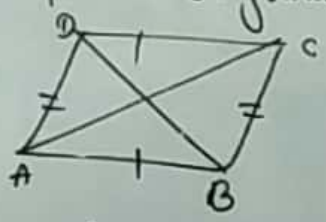
$AB = \sqrt{(6-5)^2 + (4+2)^2}$

$= \sqrt{1+36} = \sqrt{37}$

$BC = \sqrt{(7-6)^2 + (-2-4)^2} = \sqrt{1+36}$

$= \sqrt{37}$

⑤ Parallelogram

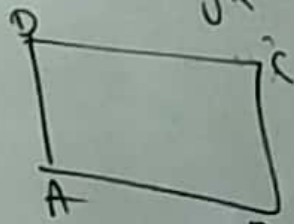


$AB = CD$

$AD = BC$

$AC \neq BD$

Rectangle

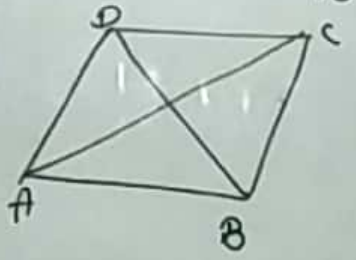


$AB = CD$

$AD = BC$

$AC = BD$

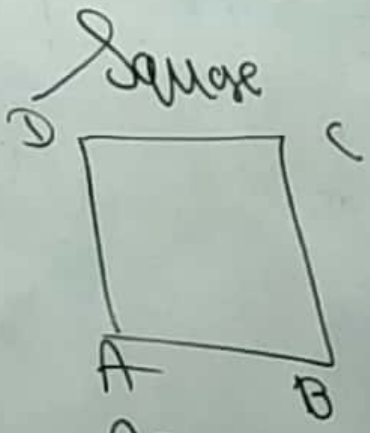
Rhombus



$AB = BC = CD = DA$

$AC \neq BD$

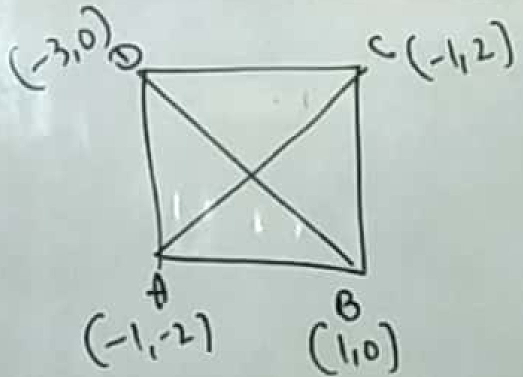
Square



$AB = BC = CD = DA$

$AC = BD$

(ii)



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

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

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

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

$AB = BC = CD = DA$

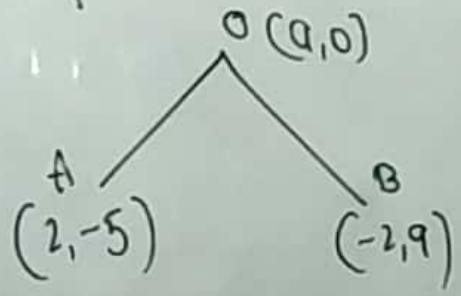
$AC = \sqrt{(-1+1)^2+(-2-2)^2}$
$= \sqrt{(-4)^2} = \sqrt{16}$
$= 4$

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

$AC = BD$

Square

⑦ Suppose point on X-axis = (a, 0)



$OA = OB$

$\sqrt{(a-2)^2 + (0+5)^2} = \sqrt{(a+2)^2 + (0-9)^2}$

Squaring both sides

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

$-4a - 4a = 81 - 25$

$-8a = 56$

$a = -7$

Point $(-7, 0)$

(8)

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

Squaring both

$$64 + y^2 + 9 + 6y = 100$$

$$y^2 + 6y - 27 = 0$$

$$y^2 + (9-3)y - 27 = 0$$

$$y^2 + 9y - 3y - 27 = 0$$

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

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

$$y = -9, \quad y = 3$$

$-9, 3$ Ans