

### **Tutorial Examples :-**

Ex1 : A rectangle with sides parallel to the axes has vertices at (3 , -2) and (-4 , -7). Find : a) the coordinates of the other two vertices.

b) the area of the rectangle.

Sol./ a) Since the sides parallel to the axes:

P is (-4 , -2) and Q is (3, -7).

b)  $d_1 = 3 - (-4) = 7$  ,  $d_2 = -2 - (-7) = 5$  , Area of rectangle =  $d_1 * d_2 = 35$ .

Ex2 : Solve the equations?

13.  $|y| = 3$

14.  $|y - 3| = 7$

15.  $|2t + 5| = 4$

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Sol./

13.  $y = 3$  or  $y = -3$

14.  $y - 3 = 7$  or  $y - 3 = -7 \Rightarrow y = 10$  or  $y = -4$

15.  $2t + 5 = 4$  or  $2t + 5 = -4 \Rightarrow 2t = -1$  or  $2t = -9 \Rightarrow t = -\frac{1}{2}$  or  $t = -\frac{9}{2}$

Ex 3:

Describe the graphs of the equations

5.  $x^2 + y^2 = 1$

6.  $x^2 + y^2 = 2$

Sol. /

5. Circle with center  $(0, 0)$  and radius 1.

6. Circle with center  $(0, 0)$  and radius  $\sqrt{2}$ .

Ex4 :

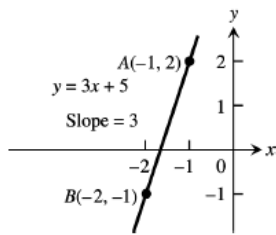
Plot the points  $A(-1, 2)$  and  $B(-2, -1)$  and find the slope (if any) of the line they determine. Also find the common slope (if any) of the lines perpendicular to line  $AB$ .

9.  $A(-1, 2), B(-2, -1)$       10.  $A(-2, 1), B(2, -2)$

Sol./

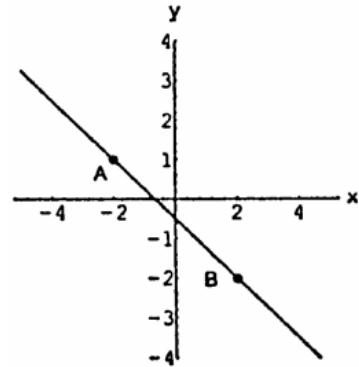
$$9. \quad m = \frac{\Delta y}{\Delta x} = \frac{-1-2}{-2-(-1)} = 3$$

perpendicular slope =  $-\frac{1}{3}$



$$10. \quad m = \frac{\Delta y}{\Delta x} = \frac{-2-1}{2-(-2)} = -\frac{3}{4}$$

perpendicular slope =  $\frac{4}{3}$



Ex 5 : write an equation for each line described.

27. Passes through  $(5, -1)$  and is parallel to the line  $2x + 5y = 15$
28. Passes through  $(-\sqrt{2}, 2)$  parallel to the line  $\sqrt{2}x + 5y = \sqrt{3}$
29. Passes through  $(4, 10)$  and is perpendicular to the line  $6x - 3y = 5$

Sol./

$$27. \quad P(5, -1), L: 2x + 5y = 15 \Rightarrow m_L = -\frac{2}{5} \Rightarrow \text{parallel line is } y - (-1) = -\frac{2}{5}(x - 5) \Rightarrow y = -\frac{2}{5}x + 1$$

$$28. \quad P(-\sqrt{2}, 2), L: \sqrt{2}x + 5y = \sqrt{3} \Rightarrow m_L = -\frac{\sqrt{2}}{5} \Rightarrow \text{parallel line is } y - 2 = -\frac{\sqrt{2}}{5}(x - (-\sqrt{2})) \Rightarrow y = -\frac{\sqrt{2}}{5}x + \frac{8}{5}$$

$$29. \quad P(4, 10), L: 6x - 3y = 5 \Rightarrow m_L = 2 \Rightarrow m_{\perp} = -\frac{1}{2} \Rightarrow \text{perpendicular line is } y - 10 = -\frac{1}{2}(x - 4) \Rightarrow y = -\frac{1}{2}x + 12$$

Ex6 :

Graph the functions

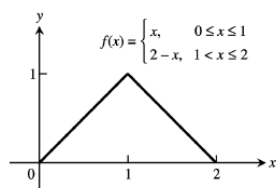
$$23. \quad f(x) = \begin{cases} x, & 0 \leq x \leq 1 \\ 2 - x, & 1 < x \leq 2 \end{cases}$$

$$24. \quad g(x) = \begin{cases} 1 - x, & 0 \leq x \leq 1 \\ 2 - x, & 1 < x \leq 2 \end{cases}$$

Sol./

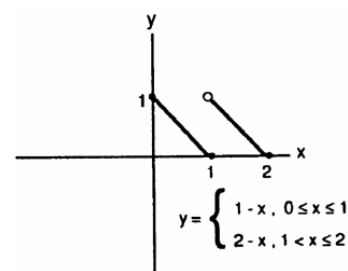
23.

x	0	1	2
y	0	1	0



24.

x	0	1	2
y	1	0	0



Ex7 :

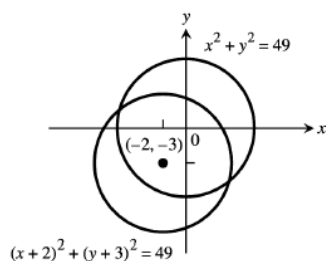
tell how many units and in what directions the graphs of the given equations are to be shifted. Give an equation for the shifted graph. Then sketch the original and shifted graphs together, labeling each graph with its equation.

19.  $x^2 + y^2 = 49$  Down 3, left 2

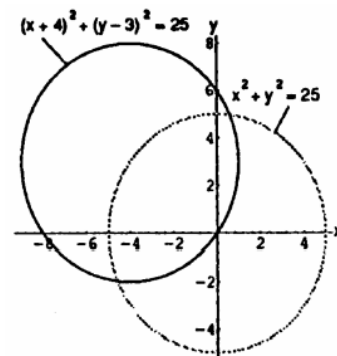
20.  $x^2 + y^2 = 25$  Up 3, left 4

Sol./

19.



20.



### H.w. Problems :-

1- Find the domain for  $y = \sqrt{\frac{x-1}{x+2}}$

2- Graph :  $y = \frac{|x-1|}{x-1}$

3- Graph the Function  $y = |x+1| + |x-3|$

4- Find the distance from the points  $(-2, 4)$  and the line  $x = 5$ .

5- Find the distance from the points  $(3, 6)$  and the line  $x + y = 3$ .