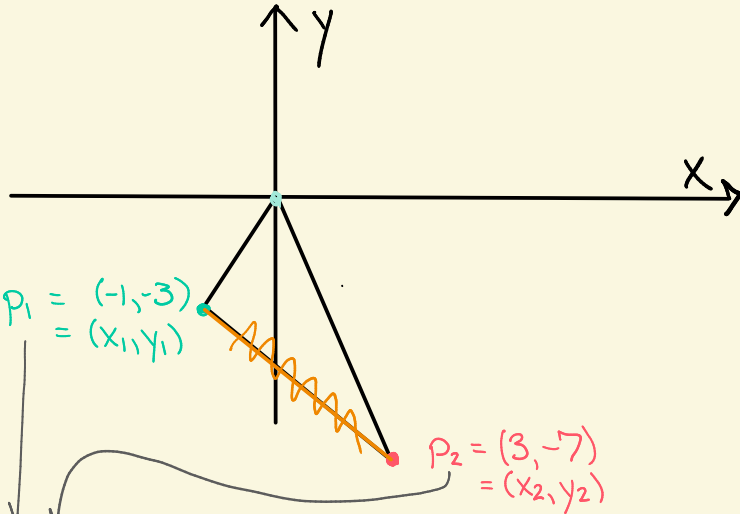


# Section 1.1

1. (1 point) Find the exact distance between the points  $(-1, -3)$  and  $(3, -7)$ .

What's the picture?



$$d(P_1, P_2) = d((x_1, y_1), (x_2, y_2))$$

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

$$= \sqrt{(3 - (-1))^2 + (-7 - (-3))^2}$$

$$= \sqrt{(3+1)^2 + (-7+3)^2}$$

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

$$= \sqrt{16 + 16}$$

$$= \sqrt{2 \cdot 16}$$

$$= \sqrt{2} \cdot \sqrt{16}$$

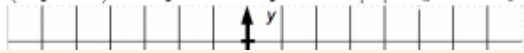
$$= 4\sqrt{2}$$

by our formula

plugging in our labels

since the radicand  
is positive

2. (1 point) Graph the equation  $|x| + y = 3$  by plotting points.



$$|x| + y = 3$$

$$\Rightarrow -|x| + (|x| + y) = -|x| + (3)$$

$$\Rightarrow y = -|x| + 3$$

outputs  $\rightarrow$   $y = -|x| + 3$   $\leftarrow$  inputs

What's the picture?

### Tools

- points
- slopes
- zeros
- intercepts

Points

x	y	(x,y)
0	$- 0  + 3$ $0 + 3 = 3$	(0,3)
-1	$- -1  + 3 =$ $-1 + 3 = 2$	(-1,2)
1	$- 1  + 3 =$ $-1 + 3 = 2$	(1,2)
-2	$- -2  + 3 =$ $-2 + 3 = 1$	(-2,1)
2	$- 2  + 3 =$ $-2 + 3 = 1$	(2,1)
⋮	⋮	⋮

Intercepts

$$y = -|x| + 3$$

① y-intercept: Set  $x=0$

$$\Rightarrow \left. \begin{aligned} y &= -|0| + 3 \\ &= 0 + 3 \\ &= 3 \end{aligned} \right\} \Rightarrow \text{y-intercept at } \boxed{(0,3)}$$

② x-intercept: Set  $y=0$

$$\Rightarrow 0 = -|x| + 3$$

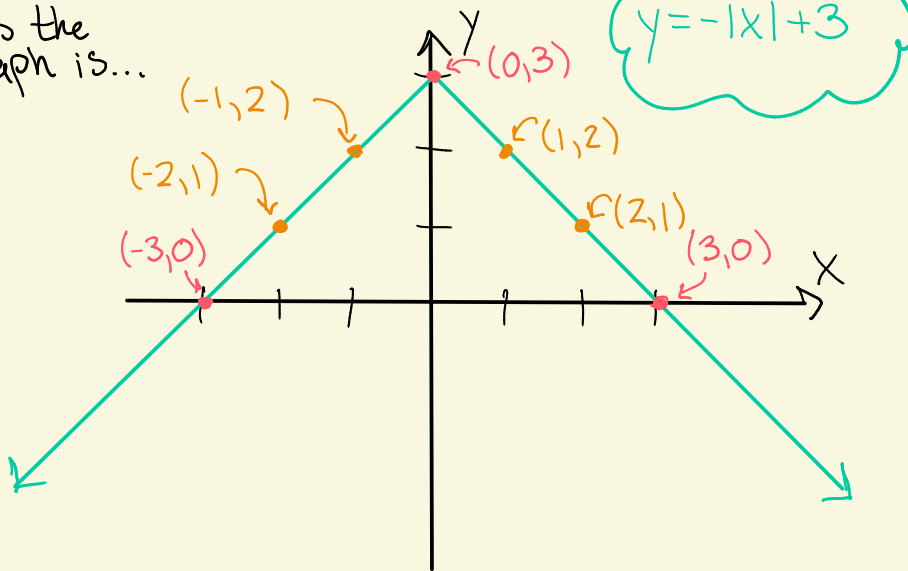
$$\Rightarrow |x| + 0 = |x| + (-|x| + 3)$$

$$\Rightarrow |x| = 3$$

$$\Rightarrow x = +3 \text{ or } x = -3$$

So x-intercepts at  
 $(3,0)$  and  $(-3,0)$ .

Thus the  
graph is...



What's the  
picture?

3. (2 points) Find the  $x$  and  $y$ -intercepts of  $-2x + 4y = 12$ .

Our equation:

$$-2x + 4y = 12$$

①  $x$ -intercepts: set  $y = 0$ .

$$\begin{aligned} y=0 &\Rightarrow -2x + 4 \cdot 0 = 12 \\ &\Rightarrow -2x + 0 = 12 \\ &\Rightarrow -2x = 12 \\ &\Rightarrow \left(-\frac{1}{2}\right) \cdot \underline{(-2x)} = \left(-\frac{1}{2}\right) \cdot (12) \\ &\Rightarrow x = \left(-\frac{1}{2}\right) \cdot (12) \\ &\Rightarrow x = -12/2 \\ &\Rightarrow x = -6. \end{aligned}$$

$x$ -intercept:  
 $(-6, 0)$ .

②  $y$ -intercepts at  $x = 0$ :

$$\begin{aligned} x=0 &\Rightarrow -2 \cdot 0 + 4y = 12 \\ &\Rightarrow 0 + 4y = 12 \\ &\Rightarrow 4y = 12 \\ &\Rightarrow \left(\frac{1}{4}\right) \cdot \underline{(4y)} = \left(\frac{1}{4}\right) \cdot 12 \\ &\Rightarrow y = 12/4 \\ &\Rightarrow y = 3 \end{aligned}$$

$y$ -intercept:  
 $(0, 3)$ .

What's the picture?

