

## Chapter 2.2 Notes Graphs of Equations in Two Variables

- \* To find the X intercept: replace the Y with 0, and then solve for X.

ex.)  $y = 2x - 2$

Replace  $y$  with 0  $\rightarrow 0 = 2x - 2$

$$\begin{array}{r} 0 = 2x - 2 \\ +2 \quad +2 \\ \hline 2 = 2x \\ \frac{2}{2} = \frac{2x}{2} \end{array} \quad x = 1$$

$x = 1$  when  $y = 0$

$(1, 0)$

- \* To find the Y intercept: replace the X with 0, and then solve for Y.

ex.)  $y = 2x - 2$

Replace  $x$  with 0  $\rightarrow y = 2(0) - 2$

$$\begin{array}{l} y = 2(0) - 2 \\ y = 0 - 2 \\ y = -2 \end{array}$$

$y = -2$  when  $x = 0$

$(0, -2)$

- 1, Find the intercepts and use them to graph the equation.

$y = x + 3$

y-intercept  
replace  $x$  with 0

$$\begin{array}{l} y = x + 3 \\ y = 0 + 3 \\ y = 3 \end{array}$$

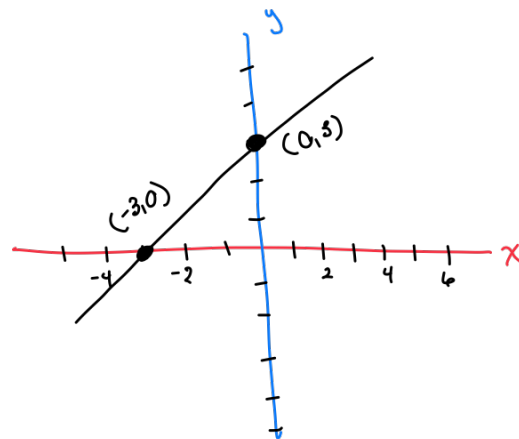
$(0, 3)$

x-intercept  
replace  $y$  with 0

$$\begin{array}{l} y = x + 3 \\ 0 = x + 3 \\ -3 \quad -3 \\ \hline -3 = x \end{array}$$

$(-3, 0)$

- \* We will make 2 equations just like the original equation.
- \* On one equation, you will replace the "X" with zero and then solve for "y".
- \* On the other equation, you will replace the "y" with zero and then solve for "x".
- \* Then you write down the the ordered pair for each equation.



To graph:

- \* click on the line symbol. /
- \* Then starting at the center (0,0), move your cursor left (-) or right (+) the 1st number in the ordered pair. Then move the cursor up (+) or down (-) the 2nd number in the ordered pair.
- \* This should make a line. Then press save and submit.

2. Find the intercepts and use them to graph the equation.

y-intercept  
Replace x with 0

$$y = 2x - 2$$

$$y = 2(0) - 2$$

$$y = 0 - 2$$

$$y = -2$$

$(0, -2)$

x-intercept  
Replace y with 0

$$y = 2x - 2$$

$$0 = 2x - 2$$

$$+2 \quad +2$$


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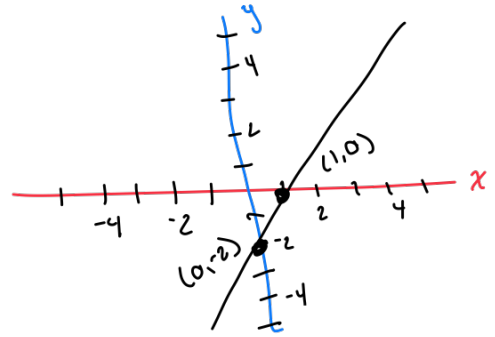

$$2 = 2x$$

$$\frac{2}{2} \quad \frac{2}{2}$$

$$1 = x$$

$(1, 0)$

- \* We will make 2 equations just like the original equation.
- \* On one equation, you will replace the "X" with zero and then solve for "y".
- \* On the other equation, you will replace the "y" with zero and then solve for "x".
- \* Then you write down the ordered pair for each equation.



3. Find the intercepts and graph the equation by plotting points.

y-intercept  
Replace x with 0

$$y = x^2 - 9$$

$$y = 0^2 - 9$$

$$y = 0 - 9$$

$$y = -9$$

$(0, -9)$

x-intercept  
Replace y with 0

$$y = x^2 - 9$$

$$0 = x^2 - 9$$

$$+9 \quad +9$$


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$$9 = x^2$$

$$\sqrt{9} = \sqrt{x^2}$$

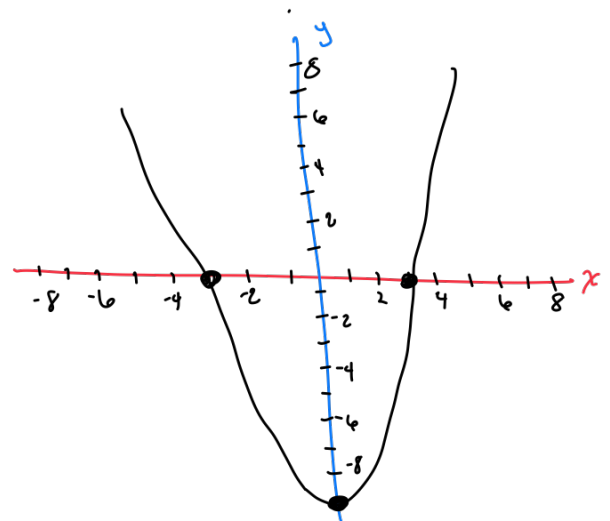
$$\pm 3 = x$$

$(3, 0), (-3, 0)$

\* REMEMBER: If you have a  $X^2 = \text{a number}$ , then you will take the square root of the number. This will give you the positive and the negative of the number.

To Graph:

- click on U symbol
- Graph the y-intercept
- Then graph one of the x-intercept



4. Find the intercepts and graph the equation by plotting points.

y-intercept  
Replace  $x$  with 0

$$5x + 7y = 35$$

$$5(0) + 7y = 35$$

$$0 + 7y = 35$$

$$7y = 35$$

$$\frac{7y}{7} = \frac{35}{7}$$

$$y = 5$$

$(0, 5)$

x-intercept  
Replace  $y$  with 0

$$5x + 7y = 35$$

$$5x + 7(0) = 35$$

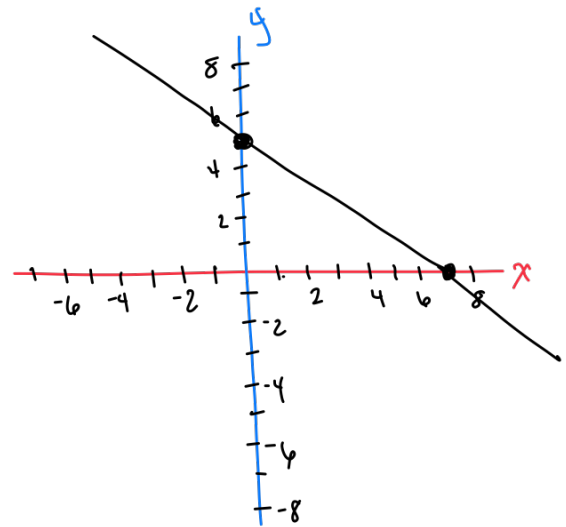
$$5x + 0 = 35$$

$$5x = 35$$

$$\frac{5x}{5} = \frac{35}{5}$$

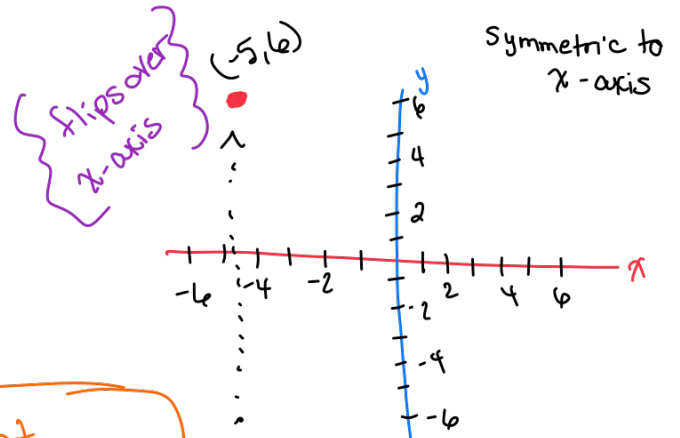
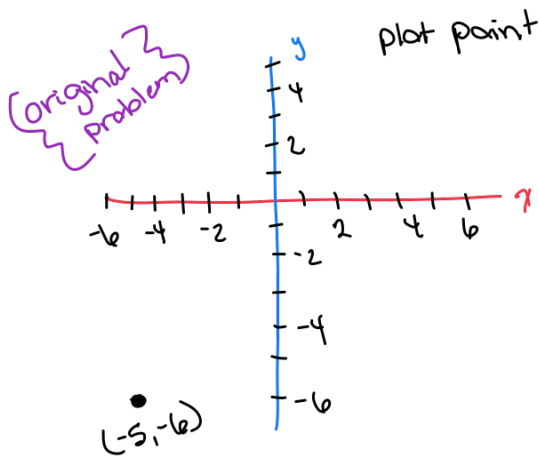
$$x = 7$$

$(7, 0)$

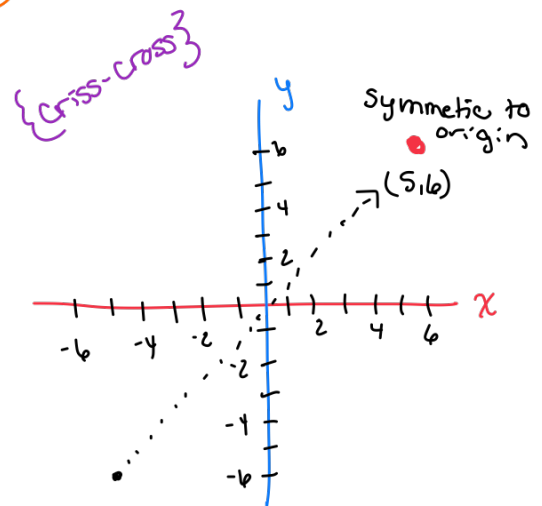
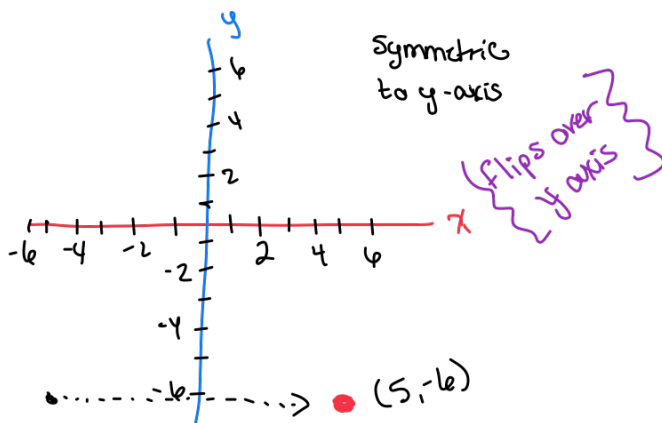


5. Plot the point. Then plot the point that is symmetric to it with respect to the x-axis, the y-axis, the origin.

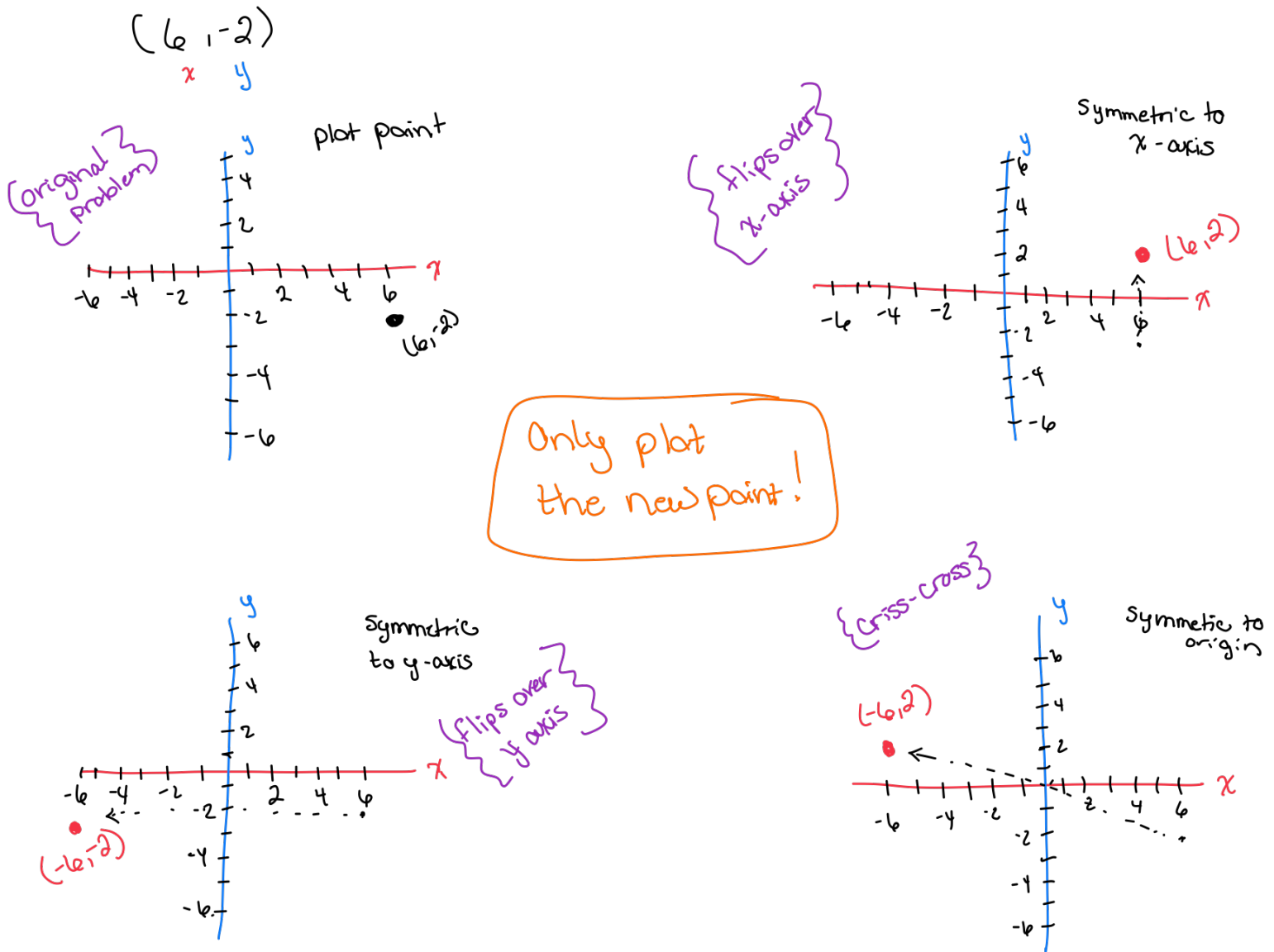
$(-5, -6)$   
 $x$   $y$



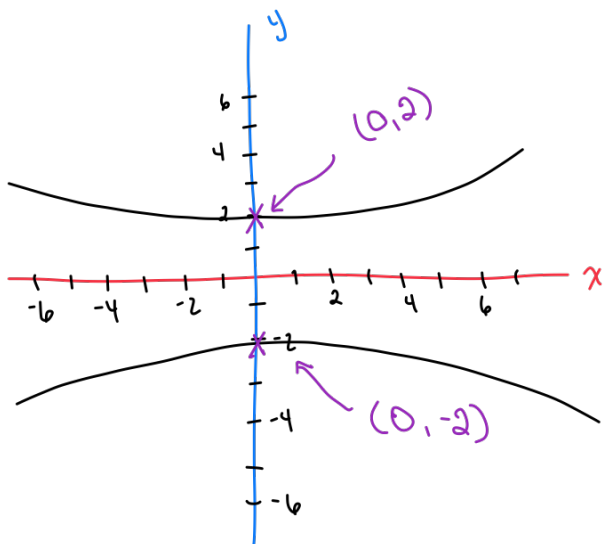
Only plot the new point!



6. Plot the point. Then plot the point that is symmetric to it with respect to the x-axis, the y-axis, the origin.



7. The graph of the equation is given. Find the intercepts and determine its symmetry.



Intercepts: where the graph crosses the x or y axis

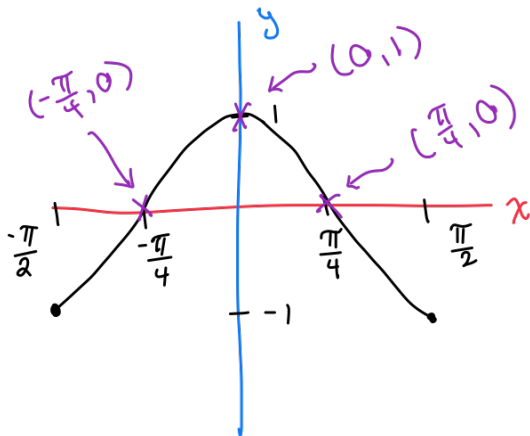
$(0, 2), (0, -2)$

Symmetry:

- \* x-axis: if you can fold on the x-axis and the 2 lines would lay on top of each other.
- \* Y-axis: if you can fold on the y-axis and the 2 lines would lay on top of each other.
- \* Origin: if you can flip the whole graph upside down and it still looks the exact same.

x-axis, y-axis, + origin

8. The graph of the equation is given. Find the intercepts and determine its symmetry.



Intercepts: Where the graph crosses the x or y axis

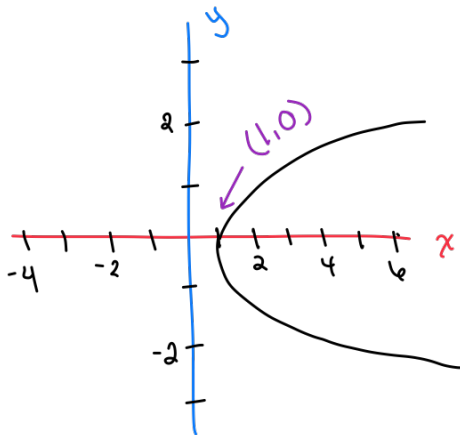
$(-\frac{\pi}{4}, 0), (0, 1), (\frac{\pi}{4}, 0)$

Symmetry:

- \* x-axis: if you can fold on the x-axis and the 2 lines would lay on top of each other.
- \* Y-axis: if you can fold on the y-axis and the 2 lines would lay on top of each other.
- \* Origin: if you can flip the whole graph upside down and it still looks the exact same.

y-axis

9. The graph of the equation is given. Find the intercepts and determine its symmetry.



Intercepts: Where the graph crosses the x or y axis

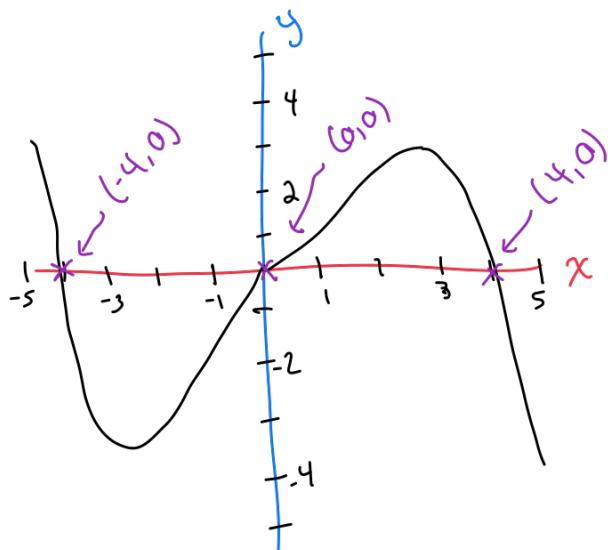
$(1, 0)$

Symmetry:

- \* x-axis: if you can fold on the x-axis and the 2 lines would lay on top of each other.
- \* Y-axis: if you can fold on the y-axis and the 2 lines would lay on top of each other.
- \* Origin: if you can flip the whole graph upside down and it still looks the exact same.

x-axis

10. The graph of the equation is given. Find the intercepts and determine its symmetry.



Intercepts: Where the graph crosses the x or y axis

$(-4, 0), (0, 0), (4, 0)$

Symmetry:

- \* x-axis: if you can fold on the x-axis and the 2 lines would lay on top of each other.
- \* Y-axis: if you can fold on the y-axis and the 2 lines would lay on top of each other.
- \* Origin: if you can flip the whole graph upside down and it still looks the exact same.

Origin