


$$\begin{array}{l} \leq \text{ or } \geq \text{ | } \bullet \\ \lt \text{ or } \gt \text{ | } \circ \end{array}$$

Recall Solving Absolute Value Equations and Inequalities Algebraically

$ 2x-4 = 17$ $\underline{ 2x-4 = 10}$ <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 5px;"> $\begin{array}{r} 2x - 4 = 10 \\ +4 \quad +4 \\ \hline 2x = 14 \\ \frac{2x}{2} = \frac{14}{2} \\ \underline{x = 7} \end{array}$ </td> <td style="padding: 5px;"> $\begin{array}{r} 2x - 4 = -10 \\ +4 \quad +4 \\ \hline 2x = -6 \\ \frac{2x}{2} = \frac{-6}{2} \\ \underline{x = -3} \end{array}$ </td> </tr> </table>	$\begin{array}{r} 2x - 4 = 10 \\ +4 \quad +4 \\ \hline 2x = 14 \\ \frac{2x}{2} = \frac{14}{2} \\ \underline{x = 7} \end{array}$	$\begin{array}{r} 2x - 4 = -10 \\ +4 \quad +4 \\ \hline 2x = -6 \\ \frac{2x}{2} = \frac{-6}{2} \\ \underline{x = -3} \end{array}$	$ x-3 \leq 10$ $\underline{ x-3 \leq 17}$ <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 5px;"> $\begin{array}{r} x - 3 \leq 17 \\ +3 \quad +3 \\ \hline \underline{x \leq 20} \end{array}$ </td> <td style="padding: 5px;"> $\begin{array}{r} x - 3 \geq -17 \\ +3 \quad +3 \\ \hline \underline{x \geq -14} \end{array}$ </td> </tr> </table> <p style="text-align: center;">AND </p>	$\begin{array}{r} x - 3 \leq 17 \\ +3 \quad +3 \\ \hline \underline{x \leq 20} \end{array}$	$\begin{array}{r} x - 3 \geq -17 \\ +3 \quad +3 \\ \hline \underline{x \geq -14} \end{array}$
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$ 2x-8 + 6 > 0$ $\underline{ 2x-8 > -6}$ <p style="text-align: center;">Greater Than + negative # ↓ Always True Infinite Solutions</p>	$ x-3 \leq -8$ $\underline{ x-3 \leq -1}$ <p style="text-align: center;">Less than + negative # ↓ Always False No Solution</p>				

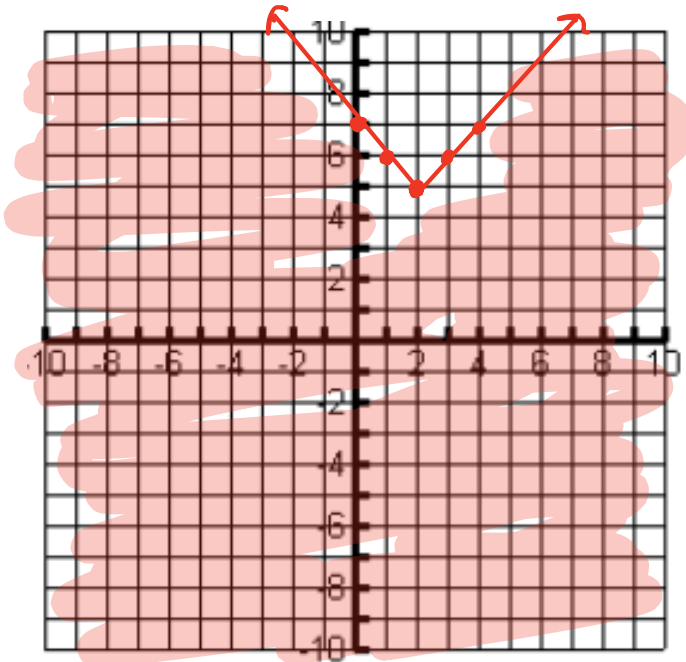
$$\begin{array}{l} \leq \text{ or } \geq \rightarrow \text{ solid line} \\ \lt \text{ or } \gt \rightarrow \text{ dotted} \\ \underline{\leq \text{ or } \lt} \rightarrow \text{ below} \\ \underline{\geq \text{ or } \gt} \rightarrow \text{ above} \end{array}$$

Graphing Absolute Value Inequalities
 Example 1

Similarly to Linear and Quadratic Equations, you will graph the function using dashed and solid lines. Afterwards, choose a test point to see where the shading needs to take place.

Change sign
 $y \leq |x - 2| + 5$ Keep sign

Vertex: (2, 5)

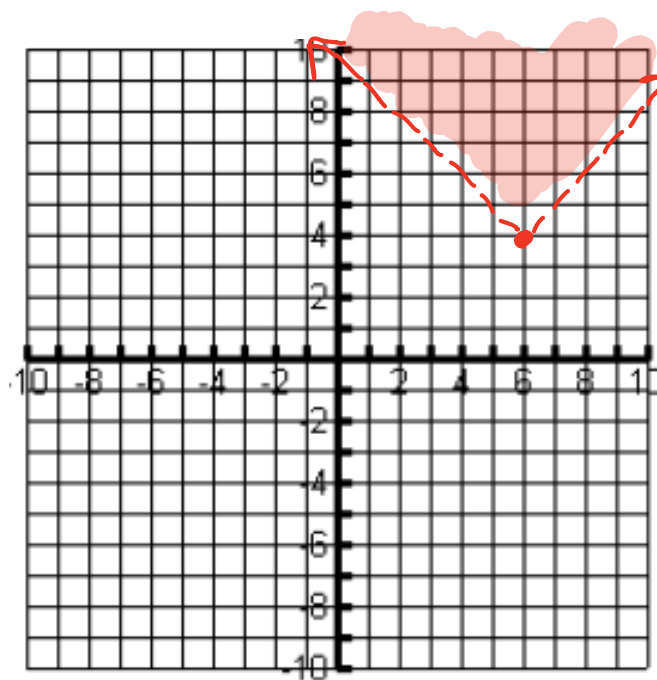


Example 2

Graph the following Absolute Value Inequality.

$$y > |x - 6| + 4$$

Vertex: $(6, 4)$

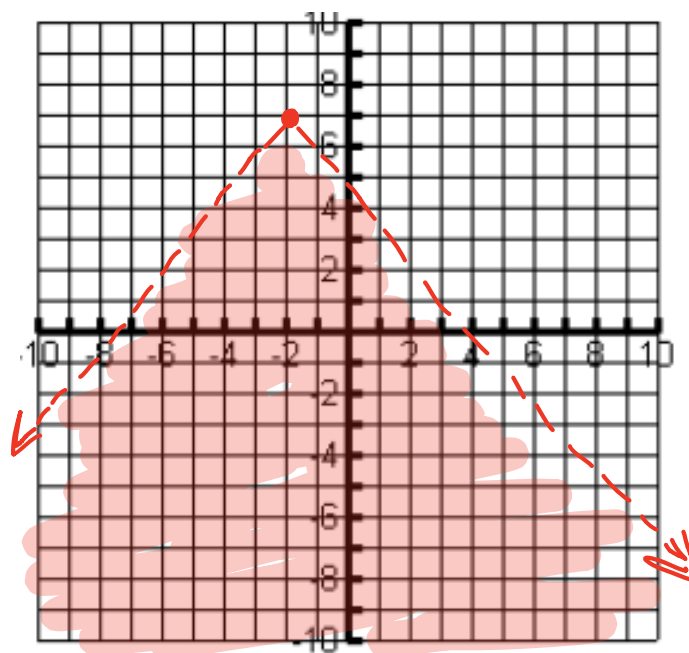


Example 3

Graph the following Absolute Value Inequality.

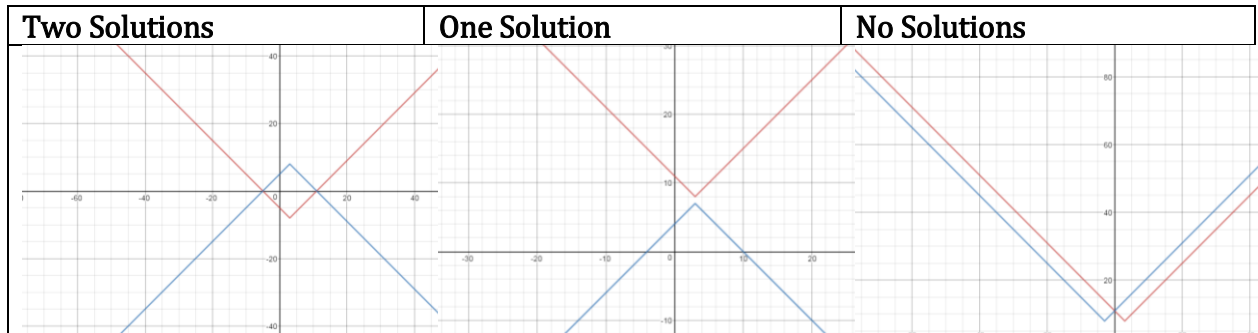
$$y < -|x + 2| + 7$$

Vertex: $(-2, 7)$



Solving Systems of Absolute Value Equations by Graphing

To solve systems of absolute value equations, graph both equations on the same graph. Find the points of intersection. There can be two, one, or no solutions.

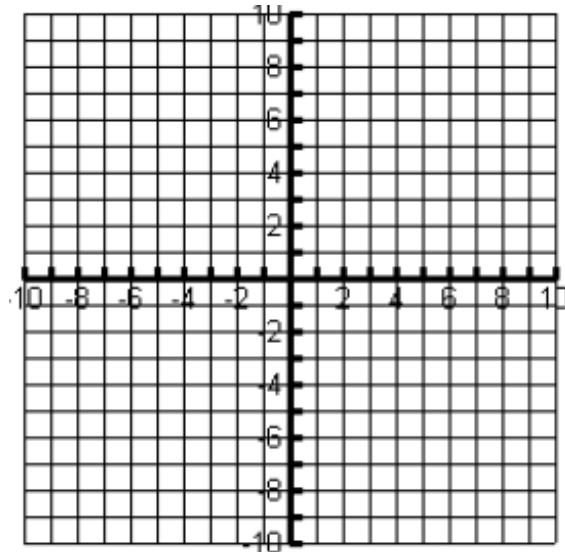


Example 1

Graph to Solve the System.

$$y = |x - 3| - 4$$

$$y = -|x - 3| + 6$$

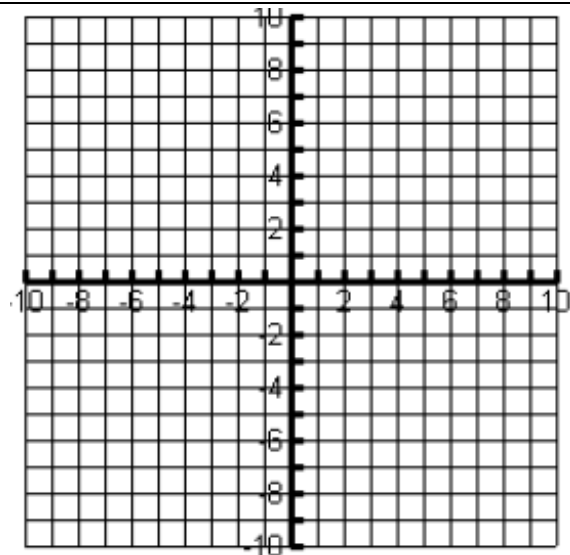


Example 2

Graph to Solve the System.

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

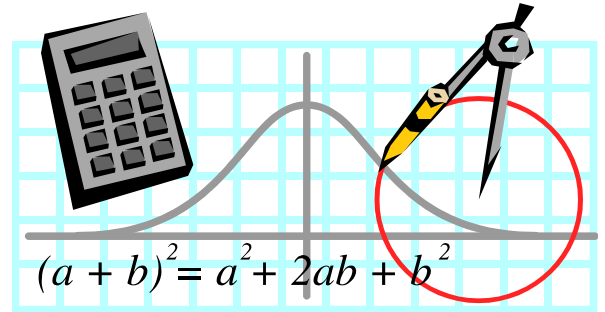
$$y = -|x - 2| + 4$$



Solving Systems of Absolute Value Equations by Graphing Using Technology

Steps to Solving Systems of Absolute Value Equations Using Your Calculator

1. Solve equations for y.
2. Enter equations into y_1 and y_2 .
3. Graph.
4. 2nd Calculate
5. #5 intersect
6. enter, enter, enter



Example 1

Graph to Solve the System using the By Hand and with the Calculator.

$$y = |x + 3| - 5$$

$$y = |x - 3| - 5$$

