

Solve the following absolute value equations algebraically. Circle or box your answer.

<p>1. $10x-12 =2x$</p> $\begin{array}{r} 10x-12=2x \\ -10x \quad -10x \end{array}$ $\begin{array}{r} 10x-12=-2x \\ -10x \quad -10x \end{array}$ $\begin{array}{r} -12=-8x \\ -8 \quad -8 \end{array}$ $\begin{array}{r} -12=-12x \\ -12 \quad -12 \end{array}$ <p>$\frac{3}{2}=x$ $1=x$</p>	<p>2. $-x+3 =-4$</p> $\begin{array}{r} -x+3=-4 \\ -3 \quad -3 \end{array}$ $\begin{array}{r} -x+3=4 \\ -3 \quad -3 \end{array}$ $\begin{array}{r} -x=-7 \\ -1 \quad -1 \end{array}$ $\begin{array}{r} -x=1 \\ -1 \quad -1 \end{array}$ <p>$x \neq 7$ $x \neq -1$</p> <p>N.S.</p>	<p>3. $2 x-4 =14$</p> $\frac{2 x-4 }{2} = \frac{14}{2}$ $ x-4 =7$ $\begin{array}{r} x-4=7 \\ +4 \quad +4 \end{array}$ $\begin{array}{r} x-4=-7 \\ +4 \quad +4 \end{array}$ <p>$x=11$ $x=-3$</p>
<p>4. $4-2 x+9 =-6$</p> $\begin{array}{r} 4-2 x+9 =-6 \\ -4 \quad -4 \end{array}$ $\begin{array}{r} -2 x+9 =-10 \\ -2 \quad -2 \end{array}$ $ x+9 =5$ $x+9=5$ $x+9=-5$ <p>$x=-4$ $x=-14$</p>	<p>5. $x+4 +3=17$</p> $\begin{array}{r} x+4 +3=17 \\ -3 \quad -3 \end{array}$ $ x+4 =14$ $x+4=14$ $x+4=-14$ <p>$x=10$ $x=-18$</p>	<p>6. $2x-4 =6x$</p> $\begin{array}{r} 2x-4=6x \\ -2x \quad -2x \end{array}$ $\begin{array}{r} 2x-4=-6x \\ -2x \quad -2x \end{array}$ $-4=4x$ $-1 \neq x$ $-4=-8x$ <p>$\frac{1}{2}=x$</p>

Solve the following absolute value inequalities. Graph the solution set & write answer in interval notation.

<p>7. $x+3 <1$</p> $x+3<1$ $x<-2$ <p>AND</p> $x+3>-1$ $x>-4$ <p>$(-4, -2)$</p>	<p>8. $4x+1 >-5$</p> $4x+1>-5$ $4x>-6$ $x>-\frac{3}{2}$ <p>OR</p> $4x+1<5$ $4x<4$ $x<1$ <p>$(-\infty, \infty)$</p>
<p>9. $3x+3 \geq 6$</p> $3x+3\geq 6$ $3x\geq 3$ $x\geq 1$ <p>OR</p> $3x+3\leq -6$ $3x\leq -9$ $x\leq -3$ <p>$(-\infty, -3] \cup [1, \infty)$</p>	<p>10. $3 x+4 \leq 3$</p> $\frac{3 x+4 }{3} \leq \frac{3}{3}$ $ x+4 \leq 1$ $x+4\leq 1$ $x\leq -3$ <p>AND</p> $x+4\geq -1$ $x\geq -5$ <p>$[-5, -3]$</p>

11. $3|7-x|+4 \leq 19$

$$\frac{3|7-x|+4}{-4} \leq \frac{19}{-4}$$

$$\frac{3|7-x|}{3} \leq \frac{15}{3}$$

$$|7-x| \leq 5$$

$7-x \leq 5$ **AND** $7-x \geq -5$

$$\frac{-x}{-1} \leq \frac{-2}{-1}$$

$$x \geq 2$$

$$\frac{-x}{-1} \geq \frac{-12}{-1}$$

$$x \leq 12$$

$[2, 12]$

12. $-2|x+3| \leq 22$

$$\frac{-2|x+3|}{-2} \leq \frac{22}{-2}$$

$$|x+3| \geq -11$$

$x+3 \geq -11$ **OR** $x+3 \leq 11$

$$x \geq -14$$

$$x \leq 8$$

$(-\infty, \infty)$

Identify the vertex of the function, tell whether the function opens up or down, and tell whether the graph is wider, narrower, or the same width as the graph of $f(x) = |x|$. Graph the function.

13. $j(x) = -2|x-4| + 3$

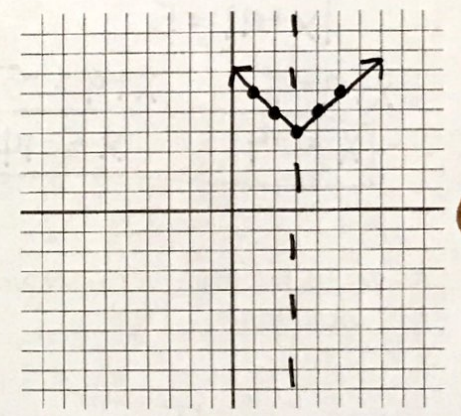
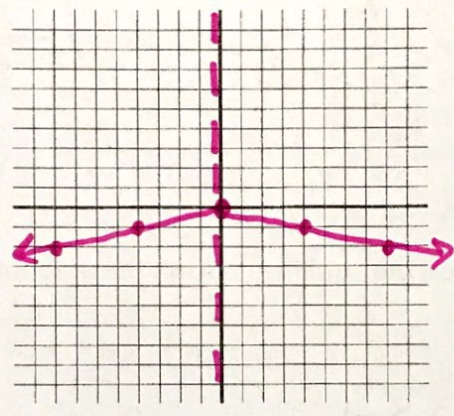
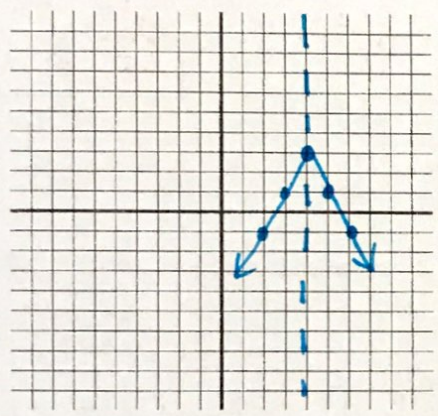
14. $g(x) = -\frac{1}{4}|x|$

15. $h(x) = |x-3| + 4$

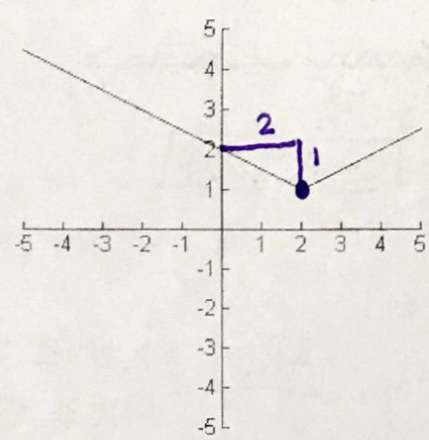
Vertex: $(4, 3)$
 Opens: Down
 Width: Narrower

Vertex: $(0, 0)$
 Opens: Down
 Width: Wider

Vertex: $(3, 4)$
 Opens: Up
 Width: Same



Write an equation of the graph.
 16.



V: $(2, 1)$
 $a = \frac{1}{2}$

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