

Key

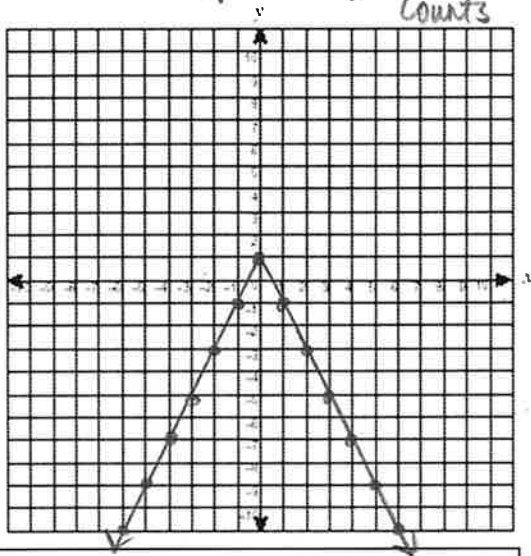
Name : \_\_\_\_\_

Date: \_\_\_\_\_

**Absolute Value Functions & Graphing Worksheet**

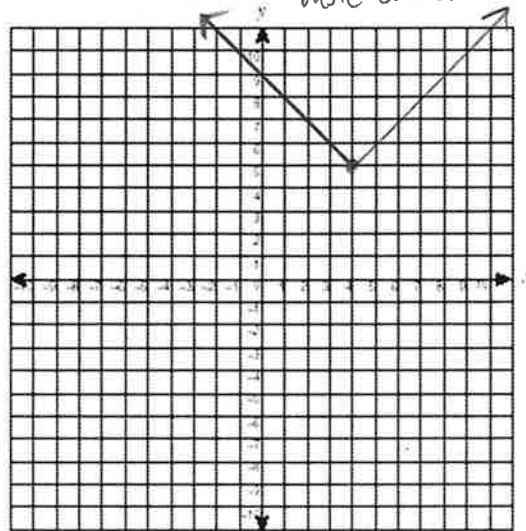
For each absolute value function, graph the function, state the domain and range, and write as a piecewise function.

1)  $y = -2|x| + 1$  *vertex (0,1) opens down, double down counts*



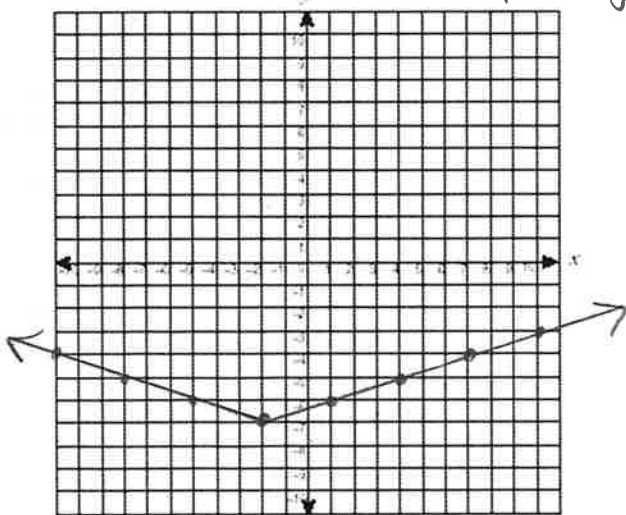
Domain:  $x \in \mathbb{R}$   
 Range:  $y \leq 1$   
 Piecewise:  $y = \begin{cases} 2x+1 & \text{when } x < 0 \\ -2x+1 & \text{when } x \geq 0 \end{cases}$

2)  $y = |x - 4| + 5$  *vertex (4,5) basic count*



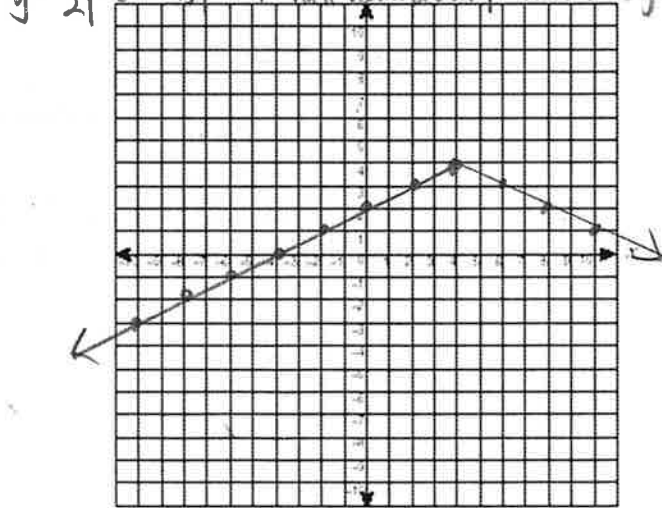
Domain:  $x \in \mathbb{R}$   
 Range:  $y \geq 5$   
 Piecewise:  $y = \begin{cases} -x+9 & \text{when } x < 4 \\ x+1 & \text{when } x \geq 4 \end{cases}$

3)  $y = \frac{1}{3}|x + 2| - 7$  *vertex (-2,-7) - opens up - divide up counts by 3*



Domain:  $x \in \mathbb{R}$   
 Range:  $y \geq -7$   
 Piecewise:  $y = \begin{cases} \frac{1}{3}x - 6\frac{1}{3} & \text{when } x \geq -2 \\ -\frac{1}{3}x - 7\frac{2}{3} & \text{when } x < -2 \end{cases}$

4)  $y = 4 - \frac{1}{2}|4 - x|$  *vertex (4,4) - opens down - half down counts* | *horiz reflect through vertex does not affect final graph*

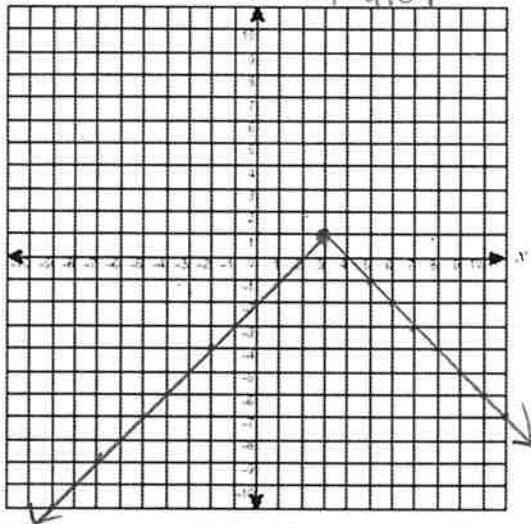


Domain:  $x \in \mathbb{R}$   
 Range:  $y \leq 4$   
 Piecewise:  $y = \begin{cases} \frac{1}{2}x + 2 & \text{when } x < 4 \\ -\frac{1}{2}x + 6 & \text{when } x \geq 4 \end{cases}$

$$y = -|-(x-3)| + 1$$

- vertex (3, 1)  
- opens down  
- basic count

5)  $y - 1 = -|3 - x|$  - horiz reflect does not affect



Domain:  $x \in \mathbb{R}$

Range:  $y \leq 1$

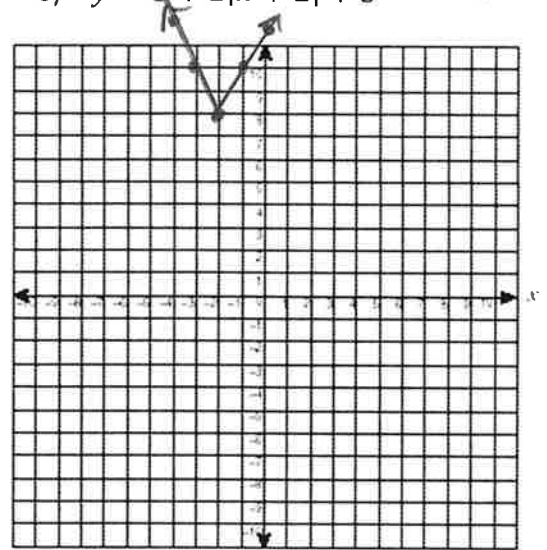
Piecewise:  $y = \begin{cases} x-2 & \text{when } x < 3 \\ -x+4 & \text{when } x \geq 3 \end{cases}$

vertex (-2, 8)

$$y = 2|x+2| + 8$$

- opens up  
- double up counts

6)  $y = 3 + 2|x+2| + 5$

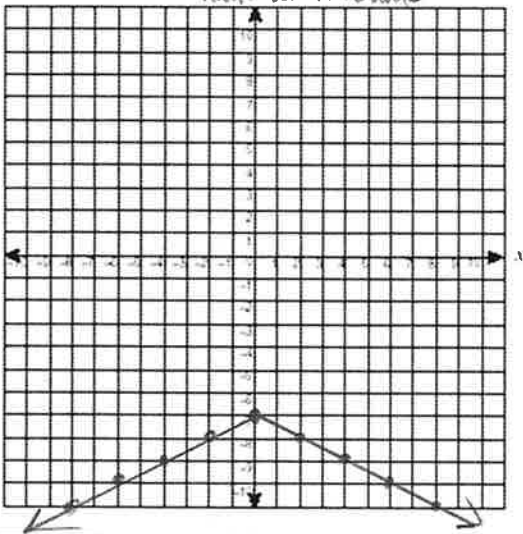


Domain:  $x \in \mathbb{R}$

Range:  $y \geq 8$

Piecewise:  $y = \begin{cases} 2x+12 & \text{when } x \geq -2 \\ -2x+4 & \text{when } x < -2 \end{cases}$

7)  $y = -\frac{1}{2}|x| - 7$  vertex (0, -7)  
- opens down  
- half down counts

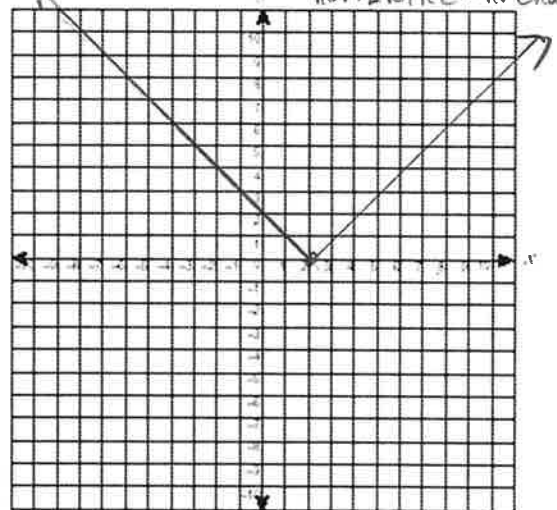


Domain:  $x \in \mathbb{R}$

Range:  $y \leq -7$

Piecewise:  $y = \begin{cases} \frac{1}{2}x-7 & \text{when } x < 0 \\ -\frac{1}{2}x-7 & \text{when } x \geq 0 \end{cases}$

8)  $y = |2 - x|$   $y = |-(x-2)|$  - vertex (2, 0)  
- opens up, basic count  
- horiz reflect = no change



Domain:  $x \in \mathbb{R}$

Range:  $y \geq 0$

Piecewise:  $y = \begin{cases} -x+2 & \text{when } x < 2 \\ x-2 & \text{when } x \geq 2 \end{cases}$