

Section 9.2 & 9.3 : Absolute Value Graphs and Domain and Range

Warm-up:

Calculate the following:

1) $|8|$

2) $|-3|$

3) $|-5 + 3|$

4) $|-4| - 7$

5) $|-10 + 3| + 7$

6) $3|-3|$

7) $4|7 - 3|$

8) $7|-8| + 2$

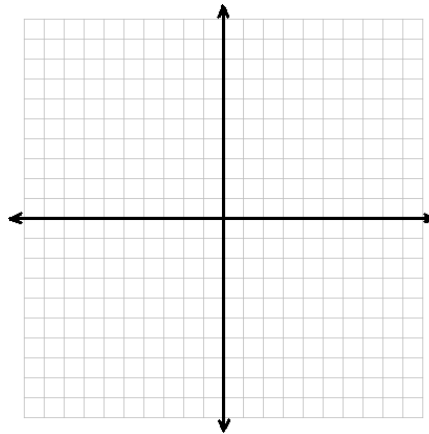
Graph the following:

1. $y = x$

| x | y |
|----|---|
| -2 | |
| -1 | |
| 0 | |
| 1 | |
| 2 | |

Domain: _____

Range: _____

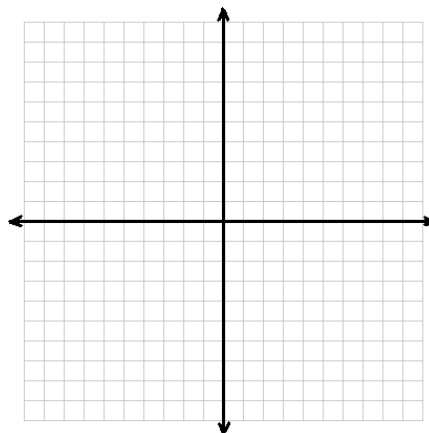


2. $y = x - 2$

| x | y |
|----|---|
| -2 | |
| -1 | |
| 0 | |
| 1 | |
| 2 | |

Domain: _____

Range: _____

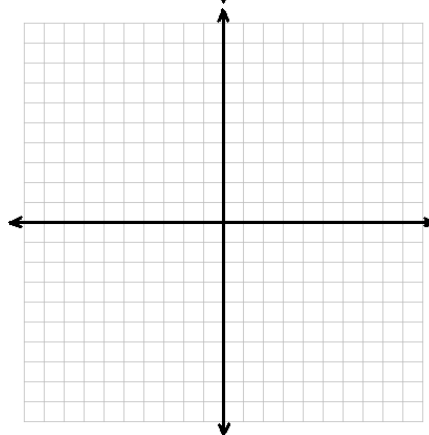


3. $y = 2x - 2$

| x | y |
|----|---|
| -2 | |
| -1 | |
| 0 | |
| 1 | |
| 2 | |

Domain: _____

Range: _____



Section 9.2 & 9.3 : Absolute Value Graphs and Domain and Range

Graphing Absolute Value Functions:

Vertical Translations

Graph the following:

1. $y = |x|$

| x | y |
|----------|----------|
| -2 | |
| -1 | |
| 0 | |
| 1 | |
| 2 | |

Domain: _____

Range: _____

2. $y = |x| + 1$

| x | y |
|----------|----------|
| -2 | |
| -1 | |
| 0 | |
| 1 | |
| 2 | |

Domain: _____

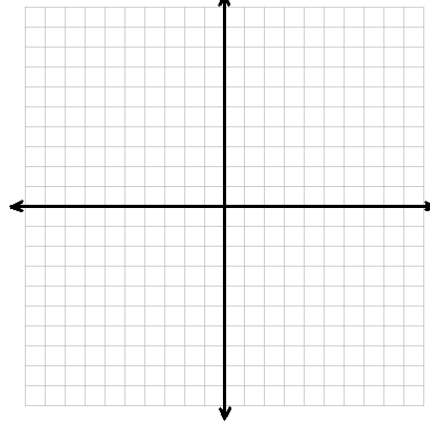
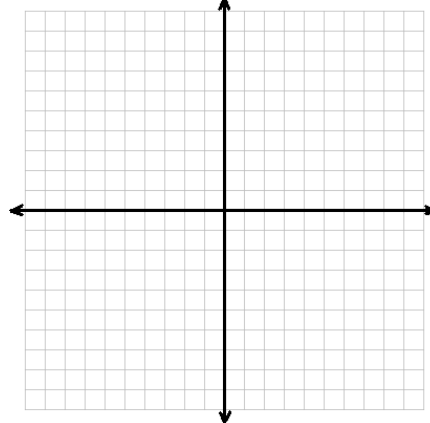
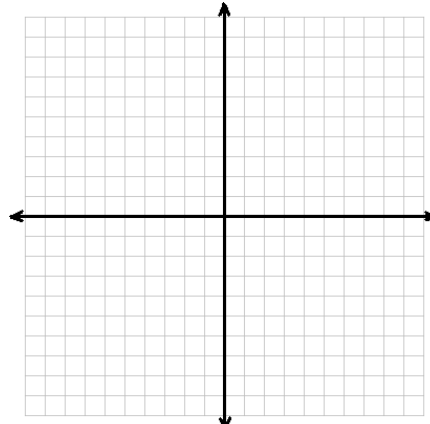
Range: _____

3. $y = |x| + 3$

| x | y |
|----------|----------|
| -2 | |
| -1 | |
| 0 | |
| 1 | |
| 2 | |

Domain: _____

Range: _____



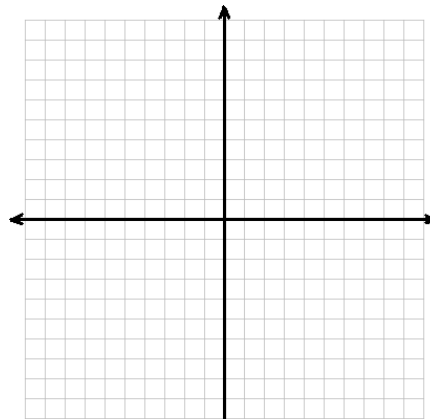
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4. $y = |x| - 2$

| x | y |
|----|---|
| -2 | |
| -1 | |
| 0 | |
| 1 | |
| 2 | |

Domain: _____

Range: _____

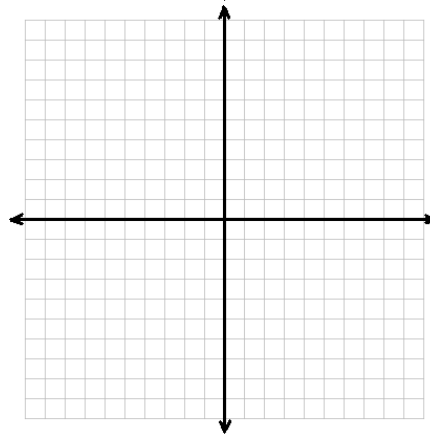


5. $y = |x| - 3$

| x | y |
|----|---|
| -2 | |
| -1 | |
| 0 | |
| 1 | |
| 2 | |

Domain: _____

Range: _____



THINGS TO CONSIDER:

Given the function $y = |x| + k$

- What does the “k” value do to the graph? [How does it compare to $y = |x|$?]
- How would a graph compare to $y = |x|$ if $k = 8$?
- What the variable “k” does to the function is called a _____ translation [also called a _____ shift].

Fill in the table below given a function: $y = |x| + k$

| Value of “k” | the graph will shift |
|--------------------|----------------------|
| $k < 0$ (Negative) | |
| $k = 0$ (Zero) | |
| $k > 0$ (Positive) | |

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Horizontal Translations

Graph the following:

1. $y = |x|$

| x | y |
|----------|----------|
| -2 | |
| -1 | |
| 0 | |
| 1 | |
| 2 | |

Domain: _____

Range: _____

2. $y = |x + 1|$

| x | y |
|----------|----------|
| -2 | |
| -1 | |
| 0 | |
| 1 | |
| 2 | |

Domain: _____

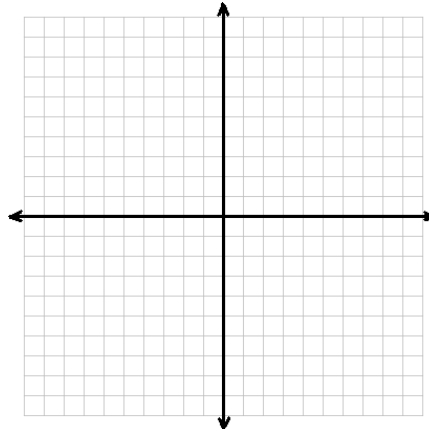
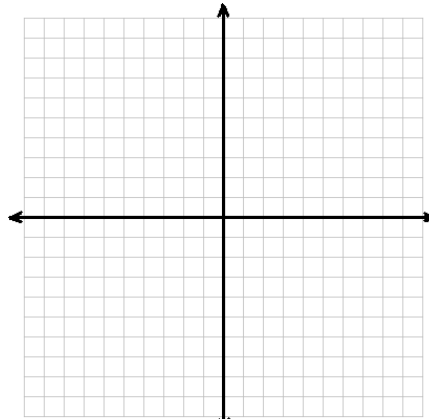
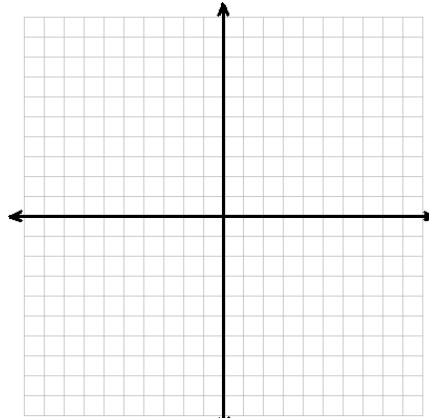
Range: _____

3. $y = |x + 3|$

| x | y |
|----------|----------|
| -2 | |
| -1 | |
| 0 | |
| 1 | |
| 2a | |

Domain: _____

Range: _____



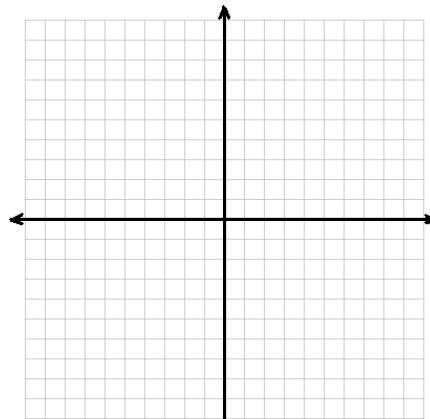
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4. $y = |x - 2|$

| x | y |
|----|---|
| -2 | |
| -1 | |
| 0 | |
| 1 | |
| 2 | |

Domain: _____

Range: _____

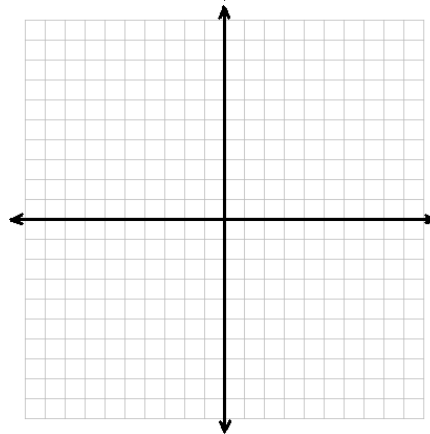


5. $y = |x - 3|$

| x | y |
|----|---|
| -2 | |
| -1 | |
| 0 | |
| 1 | |
| 2 | |

Domain: _____

Range: _____



THINGS TO CONSIDER

Given the function $y = |x - h|$

- What does the “h” value do to the graph? [How does it compare to $y = |x|$?]
- How would a graph compare to $y = |x|$ if $h = 8$?
- What the variable “h” does to the function is called a _____ translation [also called a _____ shift].

Fill in the table below given a function: $y = |x - h|$

| Value of “h” | the graph will shift |
|--------------------|----------------------|
| $h < 0$ (Negative) | |
| $h = 0$ (Zero) | |
| $h > 0$ (Positive) | |

Section 9.2 & 9.3 : Absolute Value Graphs and Domain and Range

Vertical Stretching and Shrinking

Graph the following:

1. $y = |x|$

| x | y |
|----------|----------|
| -2 | |
| -1 | |
| 0 | |
| 1 | |
| 2 | |

Domain: _____

Range: _____

2. $y = -|x|$

| x | y |
|----------|----------|
| -2 | |
| -1 | |
| 0 | |
| 1 | |
| 2 | |

Domain: _____

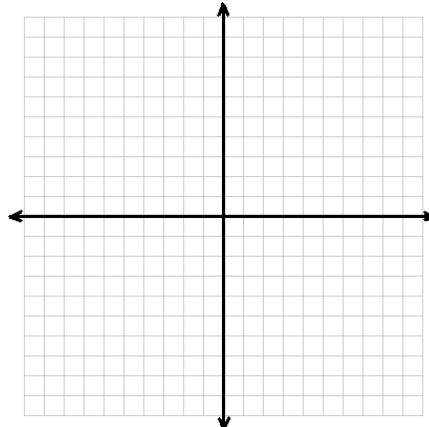
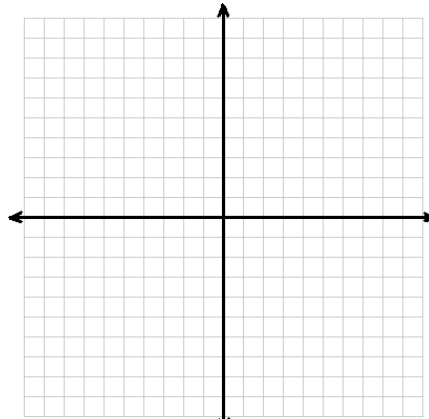
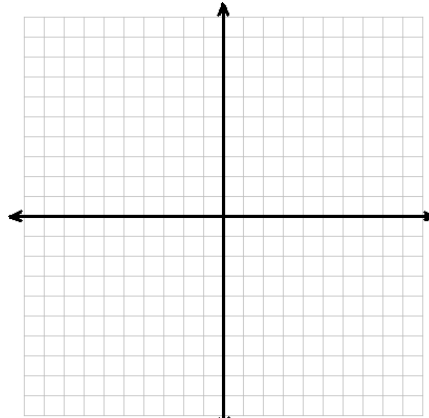
Range: _____

3. $y = 2|x|$

| x | y |
|----------|----------|
| -2 | |
| -1 | |
| 0 | |
| 1 | |
| 2 | |

Domain: _____

Range: _____



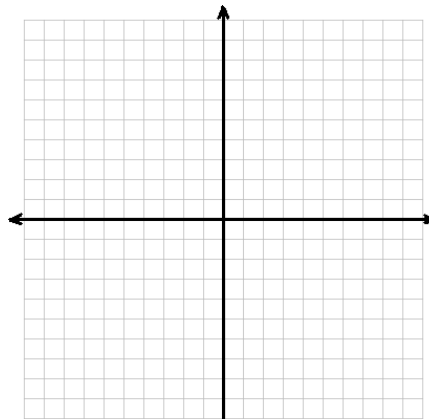
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4. $y = -2|x|$

| x | y |
|----|---|
| -2 | |
| -1 | |
| 0 | |
| 1 | |
| 2 | |

Domain: _____

Range: _____

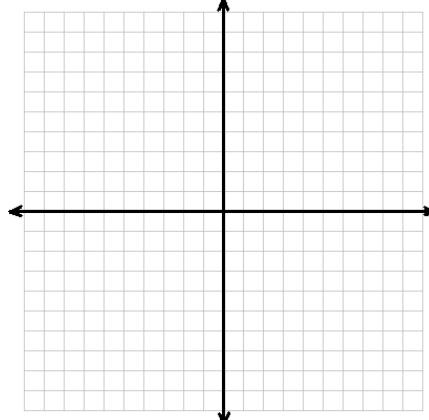


5. $y = \frac{1}{2}|x|$

| x | y |
|----|---|
| -2 | |
| -1 | |
| 0 | |
| 1 | |
| 2 | |

Domain: _____

Range: _____

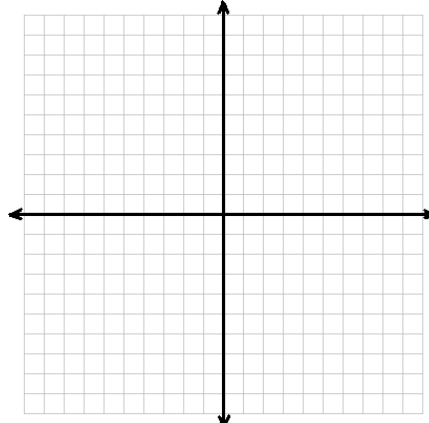


6. $y = -\frac{1}{2}|x|$

| x | y |
|----|---|
| -2 | |
| -1 | |
| 0 | |
| 1 | |
| 2 | |

Domain: _____

Range: _____



THINGS TO CONSIDER:

Given the function $y = a|x|$

- What does the “a” value do to the graph? [How does it compare to $y = |x|$?]
- How would a graph compare to $y = |x|$ if $a = 8$?
- What the variable “a” does to the function is called a _____ stretch/shrink and determines if the function opens _____ or _____.

Name: _____ Date: _____ Block: _____

Section 9.2 & 9.3: *Absolute Value Graphs and Domain and Range*

Fill in the table below given a function: $y = a|x|$

| Value of “a” | the graph will shift |
|----------------------------------|-----------------------------|
| $a < -1$ (Negative) | |
| $-1 < a < 0$ (Negative fraction) | |
| $a = 0$ (Zero) | |
| $0 < a < 1$ (Positive fraction) | |
| $a > 1$ (Positive) | |