

Absolute Value Inequalities Match

A B C

Name _____

Directions: Match the absolute value inequality from column A, with its solution from column B and graph from column C. Record the number of the row for your answers under the empty B and C columns. Show your algebraic work for arriving at the solution.

A	Absolute Value Inequality	B	C	B Interval Notation	C Graph
1	$ x+1 \geq 3$			1 $(3, \infty)$	
2	$ 2x+3 < 13$			2 $(-\infty, -1) \cup (5, \infty)$	
3	$\frac{ 3x }{6} \geq 4$			3 $(-\infty, \infty)$	
4	$ x-3 < 2x-6$			4 $(-\infty, -4] \cup [2, \infty)$	
5	$ x-2 > 3$			5 $(-8, 5)$	
6	$ 3-2x \leq 5$			6 $(-\infty, -8) \cup (0, \infty)$	
7	$ x+4 + 2 > 6$			7 $(-\infty, -6) \cup (2, \infty)$	
8	$ 2x-6 \geq -8$			8 $[-1, 4]$	
9	$-3 x-4 \geq -9$			9 $(-\infty, -8] \cup [8, \infty)$	
10	$-2(2x+4 -2) < -12$			10 $[1, 7]$	

Dec 2-8:09 AM

Absolute Value Inequalities Match

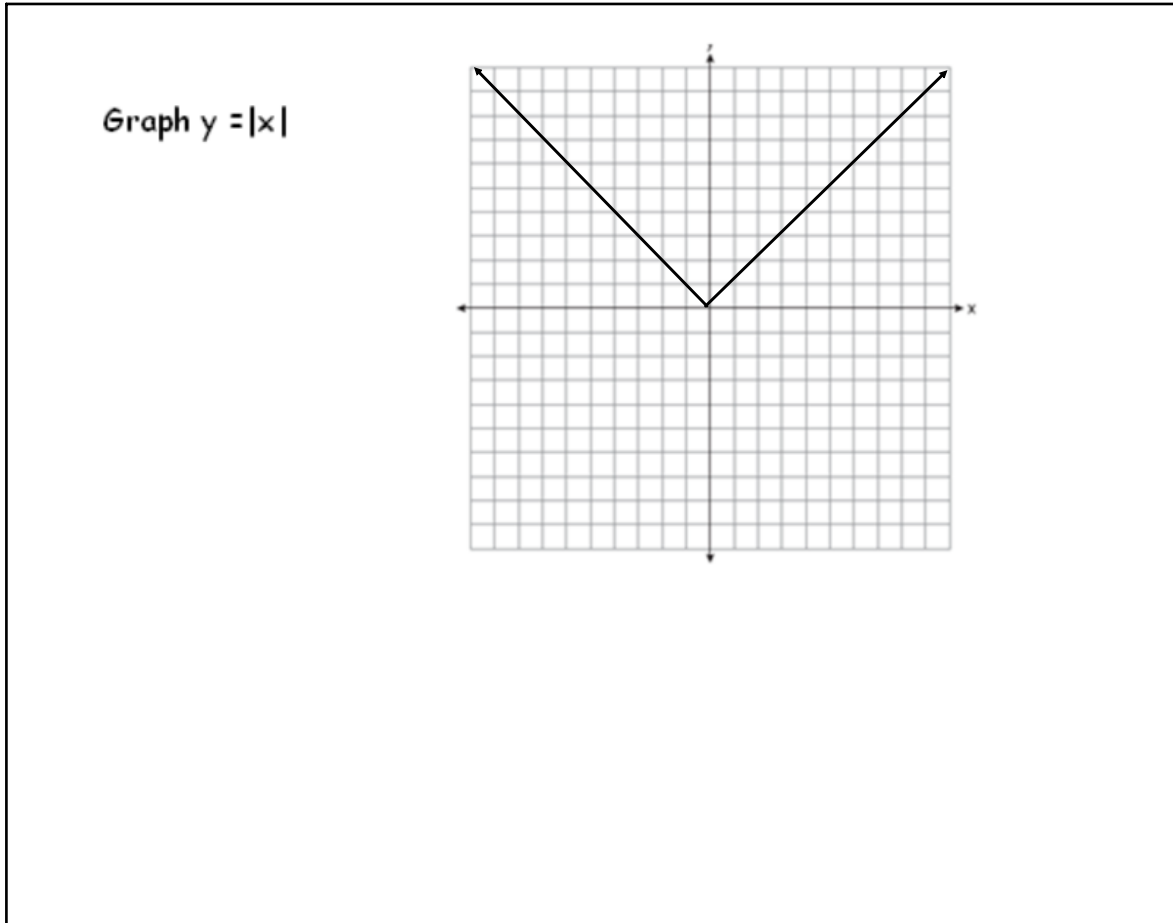
A B C

Name ANSWERS

Directions: Match the absolute value inequality from column A, with its solution from column B and graph from column C. Record the number of the row for your answers under the empty B and C columns. Show your algebraic work for arriving at the solution.

A	Absolute Value Inequality	B	C	B Interval Notation	C Graph
1	$ x+1 \geq 3$	4	1	1 $(3, \infty)$	
2	$ 2x+3 < 13$	5	8	2 $(-\infty, -1) \cup (5, \infty)$	
3	$\frac{ 3x }{6} \geq 4$	9	3	3 $(-\infty, \infty)$	
4	$ x-3 < 2x-6$	1	5	4 $(-\infty, -4] \cup [2, \infty)$	
5	$ x-2 > 3$	2	7	5 $(-8, 5)$	
6	$ 3-2x \leq 5$	8	9	6 $(-\infty, -8) \cup (0, \infty)$	
7	$ x+4 + 2 > 6$	6	2	7 $(-\infty, -6) \cup (2, \infty)$	
8	$ 2x-6 \geq -8$	3	10	8 $[-1, 4]$	
9	$-3 x-4 \geq -9$	10	6	9 $(-\infty, -8] \cup [8, \infty)$	
10	$-2(2x+4 -2) < -12$	7	4	10 $[1, 7]$	

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Dec 1-10:44 AM

QUESTION: What does the graph of $y = 3|x - 2| - 4$ look like?

1. a) Create a Table of Values for $y = 3|x - 2| - 4$ on the domain $-1 \leq x \leq 6$, graph the points and connect with lines.

b) What letter does the graph look like? **V**

c) What are the coordinates of the vertex (turning point)?
(2, -4)

d) What is the y-intercept of the graph? **(0, 2)**

e) What's the deal with the slope of the graph?
m = -3 from $(-\infty, 2)$
m = +3 $(2, \infty)$

f) Is this a function? **yes**

g) State the domain and Range
D: $(-\infty, \infty)$
R: $[-4, \infty)$

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2. a) Create a Table of Values for the equation $y = -2|x+1|-3$ on the domain $-4 \leq x \leq 3$, graph the points and connect with lines.

b) What letter does the graph look like? **Λ**

c) What are the coordinates of the vertex (turning point)?

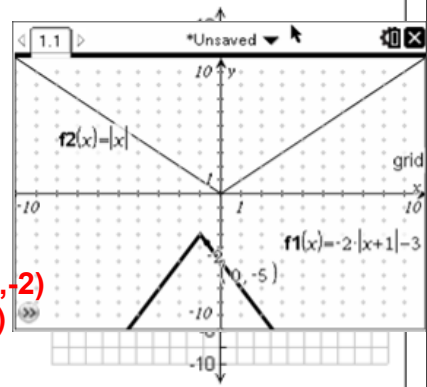
$(-1, -3)$

d) What is the y-intercept of the graph? **$(0, -5)$**

e) What's the deal with the slope of the graph? **$m=+3$ from $(-\infty, -2)$
 $m=-3$ $(-2, \infty)$**

f) Is this a function? **yes**

g) State the domain and Range **$D:(-\infty, \infty)$
 $R:(-\infty, -3)$**



uncover answer below

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Analysis Questions

1. Is there a connection between the values in the equation and the coordinates of the vertex?

**+/- outside the function shifts up/down (+ is up)
+/- inside the function shifts left/right (+ is left)
a negative coefficient flips the function upside down**

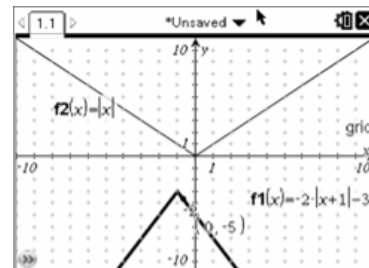
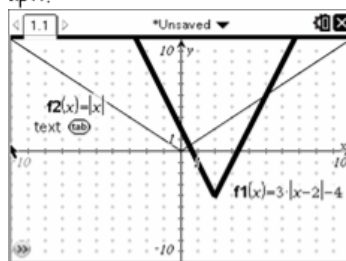
2. Is there a connection between the values in the equations and the slopes of the graph?

**a positive coefficient: negative then positive $\searrow \nearrow$
a negative coefficient: positive then negative $\nearrow \searrow$**

3. In #1 the coefficient of the absolute value was 3 and in #2 the coefficient was -2. How do you think those affected the graph?

both 3 & -2 made the graph "skinny"

the -2 flipped the graph upside down



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Absolute Value Functions

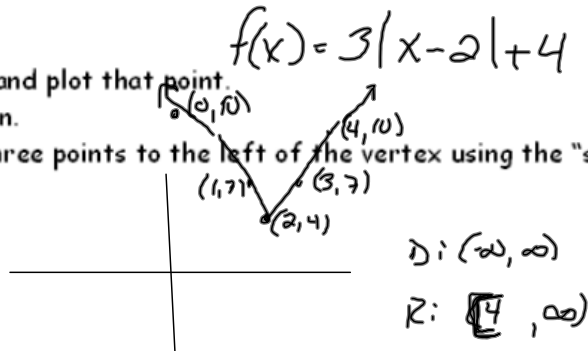
General Form: $y = a|x - h| + k$

Vertex (h, k)
 a is the "slope" of the graph

Positive a , graph opens up
 Negative a graph opens down

To graph an absolute value function

1. Find the coordinates of the vertex and plot that point.
2. Decide if the graph opens up or down.
3. Plot three points to the right and three points to the left of the vertex using the "slope."
4. Connect.
5. State the Domain and Range



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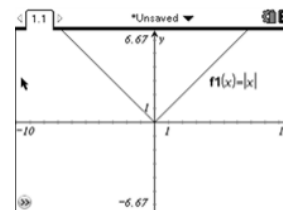
GENERAL

The transformations so far follow these rules:

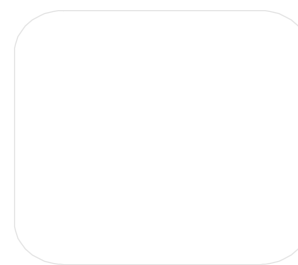
- $f(x) + a$ is $f(x)$ shifted upward a units
- $f(x) - a$ is $f(x)$ shifted downward a units
- $f(x + a)$ is $f(x)$ shifted left a units
- $f(x - a)$ is $f(x)$ shifted right a units
- $-f(x)$ is $f(x)$ flipped upside down ("reflected about the x -axis")
- $f(-x)$ is the mirror of $f(x)$ ("reflected about the y -axis")

$f(x) = |x|$ ✓
 $f(x) = x^2$ ✓
 $f(x) = 3x$ ✓
 $f(x) = 3(x-2)$ ✓

EX: $f(x) = -|x-3| + 5$
 transforms the graph of $|x|$

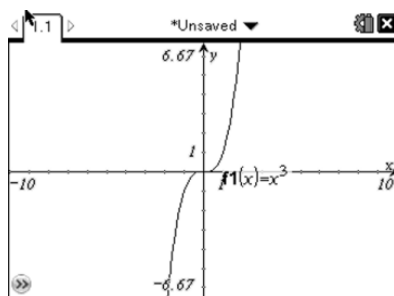


EX: $f(x) = -2(x^2 + 4) - 5$
 transforms the graph of x^2

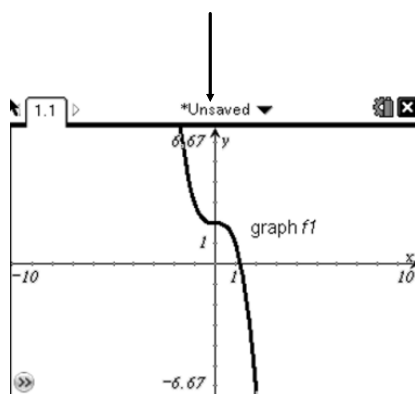


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EX: $f(x) = (-x^3) + 5$
 transforms the graph of x^3



$f(x) = x^3$

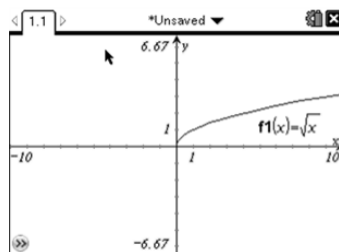


EX: $f(x) = (-x^3) + 5$

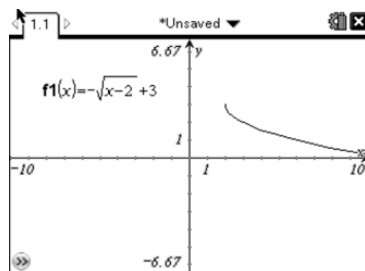
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EX: $f(x) = -\sqrt{x-2} + 3$

transforms the graph of \sqrt{x}

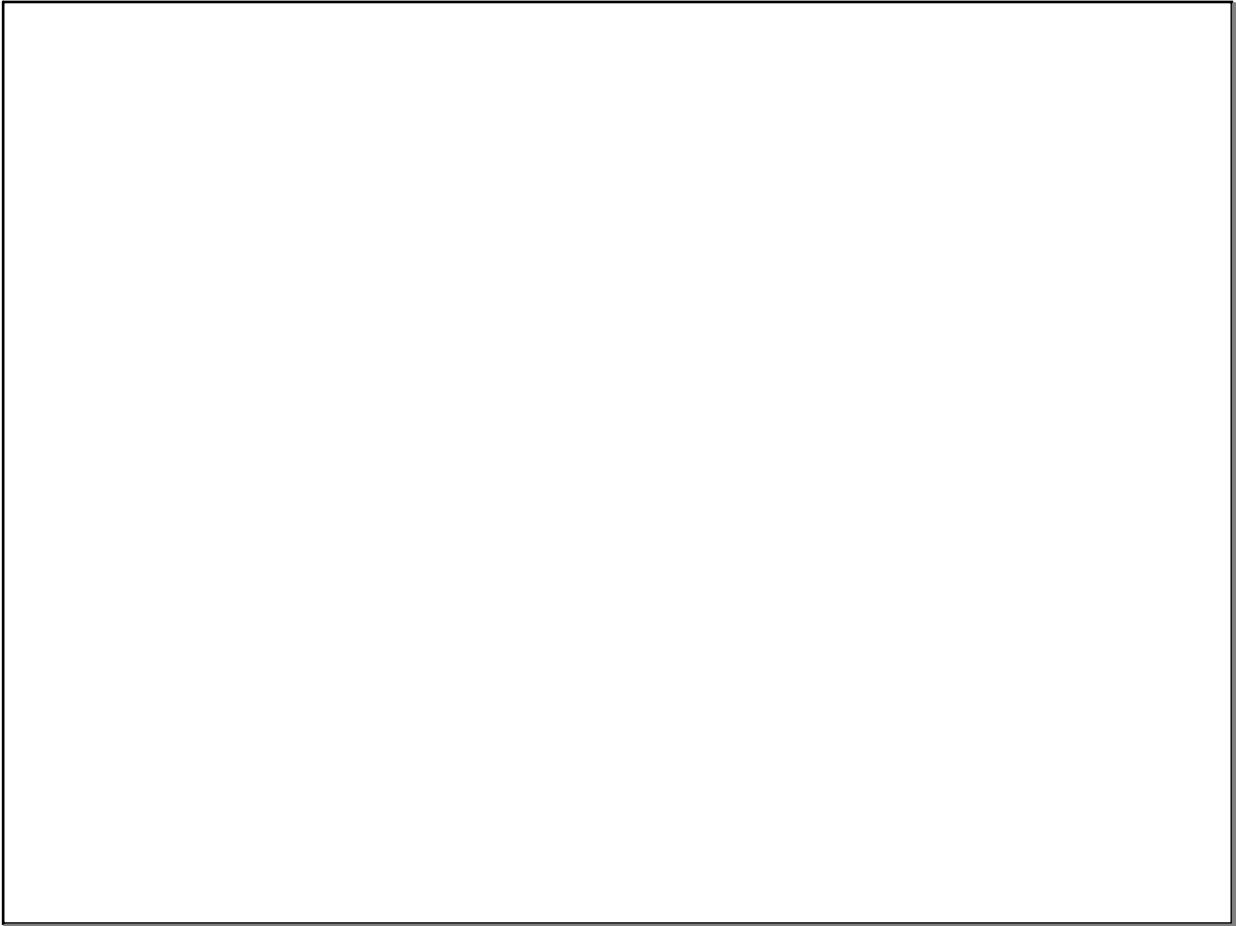


$f(x) = \sqrt{x}$



$f(x) = -\sqrt{x-2} + 3$

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Dec 5-9:31 AM