

DO NOW

Grab a voter and get logged in.

4.4 Graphing Absolute Value Functions - Day 2

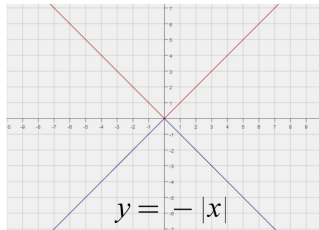
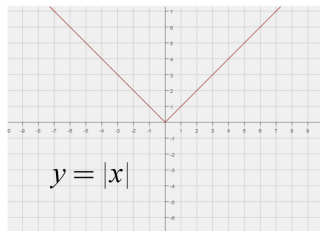
Transformations: changing by reflecting (flip), rotating (turn), translating (slide) or dilating (resize).

★ Compare $f(x) = a|x-h|+k$ to $f(x) = |x|$.

Each letter indicates a specific change.

$a \rightarrow$ reflecting and dilating
 $h \rightarrow$ horizontal translating (slide)
 $k \rightarrow$ vertical translating

Parent Function

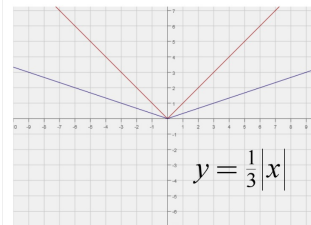
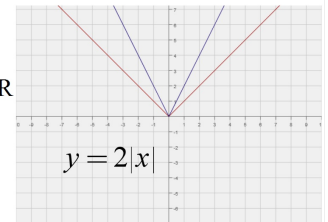


Reflection in the x-axis:

If a is negative, the graph opens downward and has been reflected in the x -axis.

Vertical stretching:

If $a > 1$, the graph is **NARROWER** and steeper (slope is bigger).



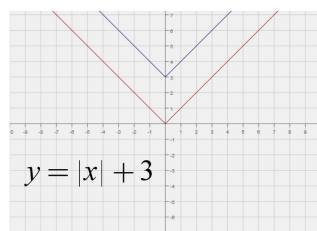
Vertical shrinking:

If $a < 1$, the graph is **WIDER** and less steep (slope is smaller).

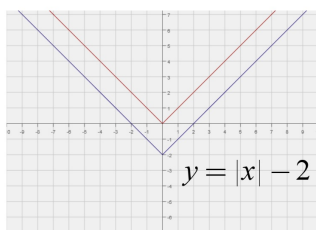
Vertical translation:

***Focus on the number after the absolute value sign

If k is positive, the graph shifts up k units.



If k is negative, the graph shifts down k units.

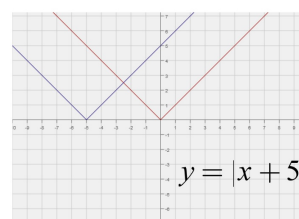
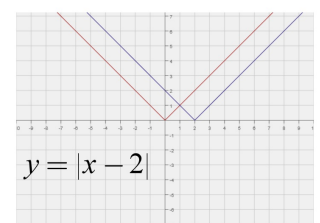


Horizontal translation:

***Focus on the number inside the absolute value sign.

★ Seems backwards!!!

If h is positive, the graph shifts right h units.



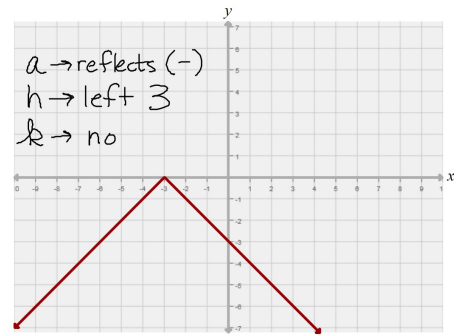
If h is negative, the graph shifts left h units.

Describe the transformation(s) of $y = |x|$ required for the following absolute value functions.

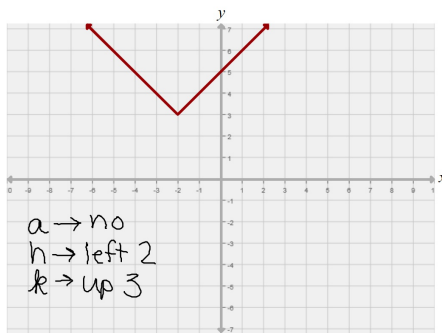
1. $y = |x| + 5$
Shift up 5 units
2. $f(x) = \frac{1}{2}|x - 3|$
wider opening,
Shift right 3 units
3. $g(x) = -|x + 6|$
reflect in x -axis
Shift left 6 units
4. $f(x) = |x + 4| - 2$
Shift left 4 units
Shift down 2 units
5. $y = 2|x| - 1$
narrower opening
Shift down 1 unit
6. $y = -|x - 1| + 3$
reflect in x -axis
Shift right 1 unit
Shift up 3 units

Which absolute value equation is represented in the given graphs?

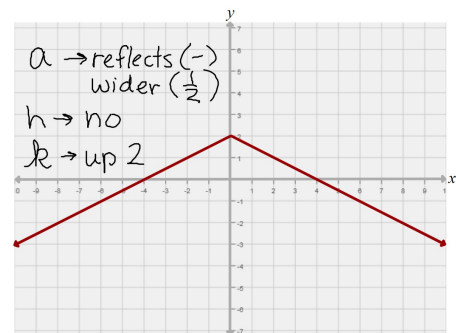
1. a. $y = |x + 3|$ b. $y = |x - 3|$
c. $y = -|x + 3|$ d. $y = -|x - 3|$



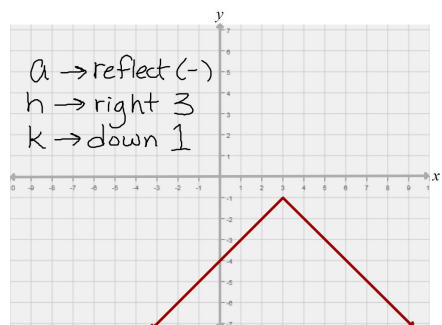
2. a. $y = |x - 2| + 3$ b. $y = |x + 3| - 2$
c. $y = |x + 2| + 3$ d. $y = |x + 3| + 2$



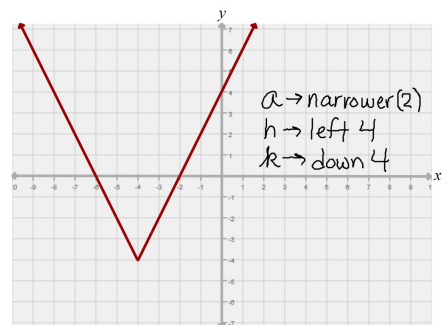
3. a. $y = -|x| + 2$ b. $y = -|x + 2|$
c. $y = -\frac{1}{2}|x| + 2$ d. $y = -\frac{1}{2}|x + 2|$



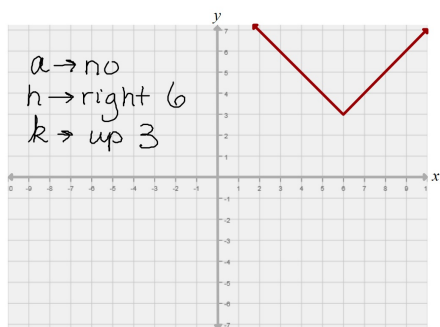
4. a. $y = |x - 3| - 1$ b. $y = -|x - 3| - 1$
c. $y = -|x + 3| - 1$ d. $y = |x + 3| - 1$



5. a. $y = 2|x + 4| - 4$ b. $y = |x + 4| - 4$
c. $y = 2|x - 4| - 4$ d. $y = |x - 4| - 4$



6. a. $y = |x - 3| + 6$ b. $y = |x + 3| + 6$
c. $y = |x + 6| + 3$ (d.) $y = |x - 6| + 3$



HOMEWORK

Worksheet - HW 4.4 - Day 2