

objective: To graph and analyze absolute value functions. 1/24/19

parent graph or function: $f(x) = |x|$ or $y = |x|$

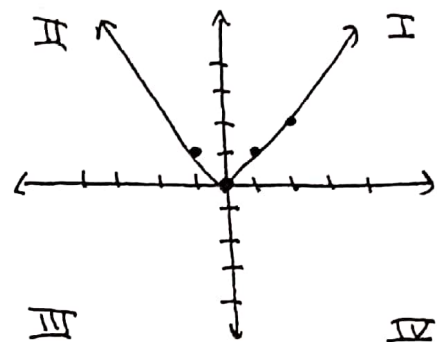
X	Y
-1	1
0	0
1	1
2	2

$$f(-1) = |-1| = 1$$

$$f(0) = |0| = 0$$

$$f(1) = |1| = 1$$

$$f(2) = |2| = 2$$



standard form of an absolute value function:

$$f(x) = a|x-h| + k \text{ or } y = a|x-h| + k$$

a = horizontal reflection if $a < 0$ (neg)
(Flips upside down)

= vertical stretch if $a > 1$ (gets skinnier)

= vertical shrink if $0 < a < 1$ (gets wider)

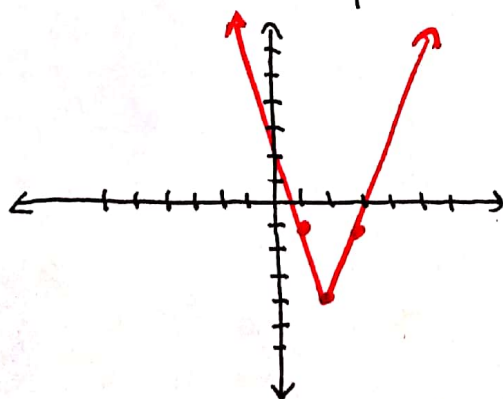
h = horizontal translation (opposite sign)

k = vertical translation (same sign)

vertex: (h, k)

↳ opp sign

example 1: $y = \frac{3}{1}|x-2| - 4$



1.) $a > 1$

vertical stretch

2.) horizontal translation by 2

3.) vertical translation of -4

1.) plot the vertex

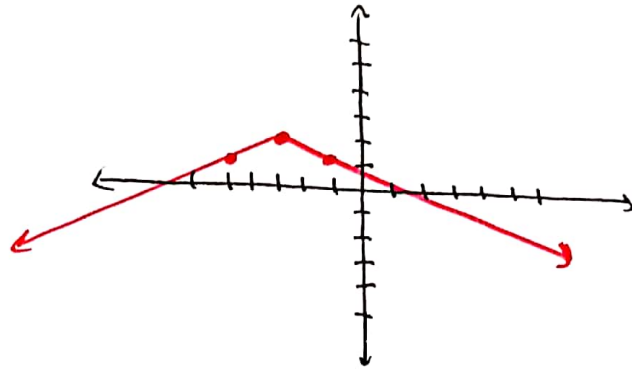
$$V: (2, -4)$$

2.) use ' a ' to create two points on both sides of vertex using $\frac{\text{rise}}{\text{run}}$. $a = \frac{3}{1}$

example 2: $y = -\frac{1}{2}|x+3| + 2$

1.) $v: (-3, 2)$

2.) $a = -\frac{1}{2}$



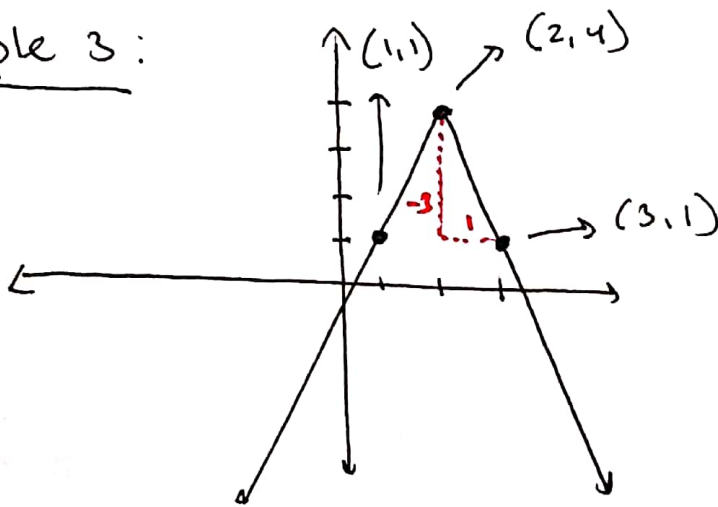
1.) horizontal reflection

2.) vertical shrink

3.) horizontal translation of -3

4.) vertical translation of 2.

example 3:



$$y = a|x-h| + k$$

$$a = -3$$

$$h = 2$$

$$k = 4$$

$$\boxed{y = -3|x-2| + 4}$$