

W-A2 Algebra 2 Week 10

Direct Variation

$k \rightarrow$ constant of variation

$$y = kx$$

$$y = mx + \cancel{b}$$

$$x = 8 \quad y = 18$$

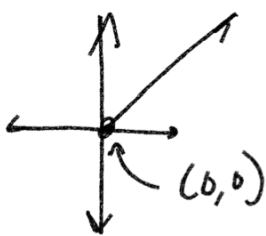
$$\frac{y}{x} = \frac{kx}{x}$$

$$k = \frac{y}{x}$$

18
8

$$x = 12 \quad y = ?$$

$$k = \frac{18 \div 2}{8 \div 2} = \frac{9}{4}$$



$$y = \frac{9}{4}x$$

$$y = \frac{9}{4}(12) = 27$$

$$x = 4 \quad y = 14$$

$$y = kx$$

$$\frac{y}{x} = \frac{kx}{x}$$

$$k = \frac{14}{4} = \frac{7}{2}$$

$$k = \frac{y}{x}$$

$$x = 10$$

$$y = 35$$

$$y = \frac{7}{2}x$$

10

$$y = \frac{7}{2} \left(\frac{10}{1} \right) = \frac{70}{2} = 35$$

x	y	y/x	k
-2	7	$7/-2$	-3.5
4	-14	$-14/4$	-3.5
6	-21	$-21/6$	-3.5

Direct Variation

$$y = kx \quad k = \frac{y}{x}$$

has consistent slope (k)

$$y = -3.5x$$

Find the direct variation equation for a line that goes through (-3, 8)

$$k = \frac{8}{-3}$$

$$k = -\frac{8}{3}$$

$$y = -\frac{8}{3}x$$

$$\frac{8}{-3}$$

$$-\frac{8}{3}$$

$$-\frac{8}{3}$$

~~$$\frac{8}{3}$$~~

x	y	y/x	k
-4	26	$26/-4$	-6.5
-2	13	$13/-2$	-6.5
6	39	$39/6$	6.5

not direct variation

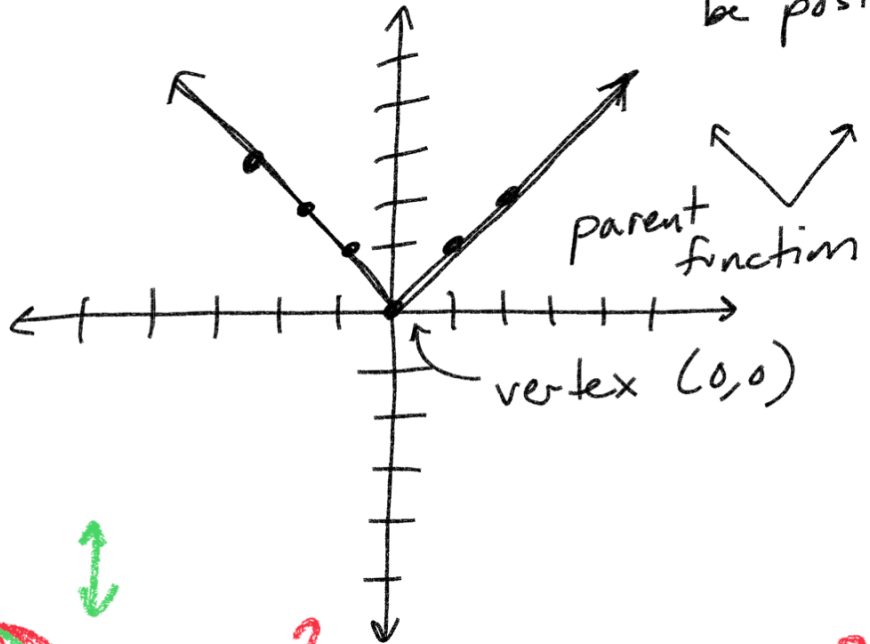
2.4 Absolute Value Graphs

Absolute Values must be positive

$$y = |x|$$

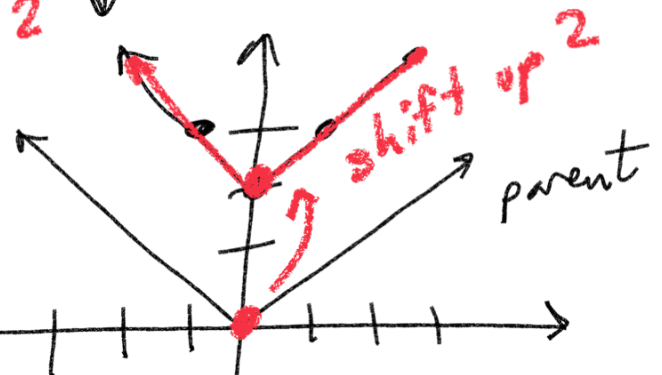
$$y = x$$

$$|-2| = 2$$



$$y = |x| + 2$$

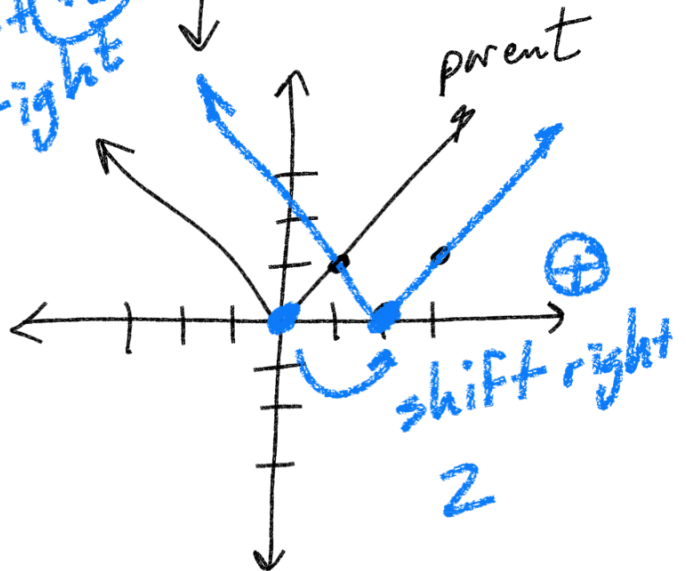
up 2



x	y
-1	3 (-1, 3)
0	2 (0, 2)
1	3

$$y = |x - 2|$$

shift +2 right

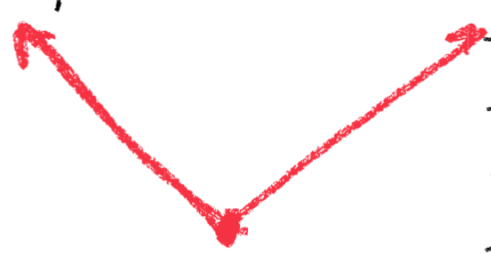


x	y
1	1 (1, 1)
2	0 (2, 0)
3	1 (3, 1)

$y = |x + 3| - 4$
 opposite 3 left, down 4

$y = |x - 2| - 5$
 right 2, down 5

(-)



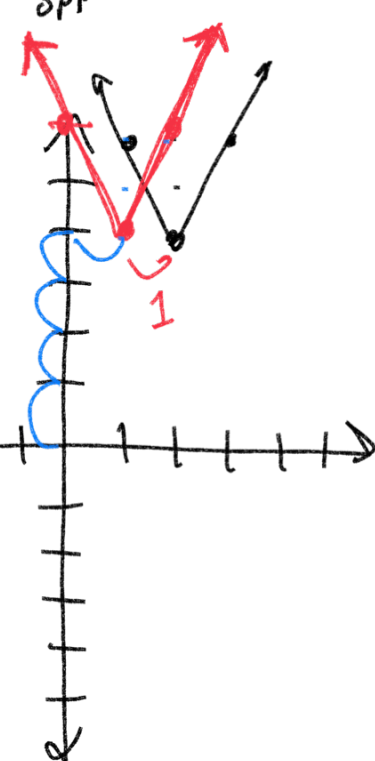
$y = |x - 2| + 1$
 right 2, up 1

$y = |x + 5| + 4$
 opposite, 5 left, 4 up

$y = |2x - 2| + 4$
 slope, right 2, up 4

$y = 2x - 2$
 slope, y-intercept

$y = |2(x - 1)| + 4$
 slope 2, right 1, up

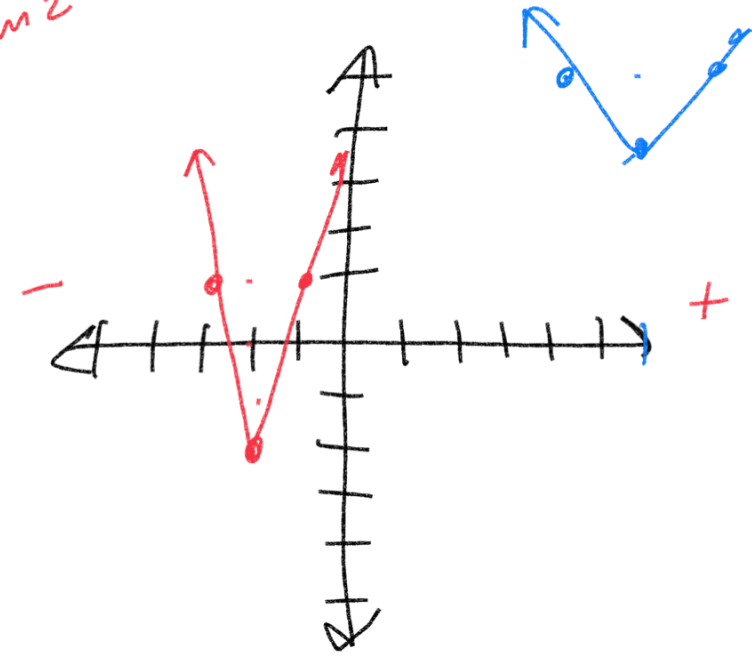


x	$ 2x - 2 + 4$	y
0	$ 2(0) - 2 + 4 = -2 + 4 = 2 + 4$	6 (0, 6)
1	$ 2(1) - 2 + 4 = 0 + 4 = 0 + 4 = 4$	4 (1, 4)
2	$ 2(2) - 2 + 4 = 2 + 4 = 2 + 4 = 6$	6 (2, 6)

$$y = |3x + 6| - 2$$

$$y = |3(x+2)| - 2$$

slope up 3 right 1 left



$$y = \left| \frac{1}{2}x - 3 \right| + 4$$

$$y = \left| \frac{1}{2}(x - 6) \right| + 4$$

$$\frac{3}{1} \div \frac{1}{2} \rightarrow \text{flip}$$

$$\frac{3}{1} * \frac{2}{1} = \frac{6}{1} = 6$$

$$\downarrow x = 8$$

$$\uparrow (x + 3) = 8$$

$$(x - 3) = 8$$

$$x = 8$$

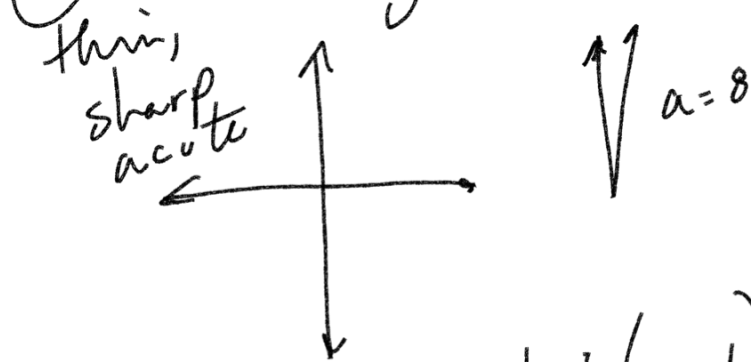
$$x = 5$$

$$x = 11$$

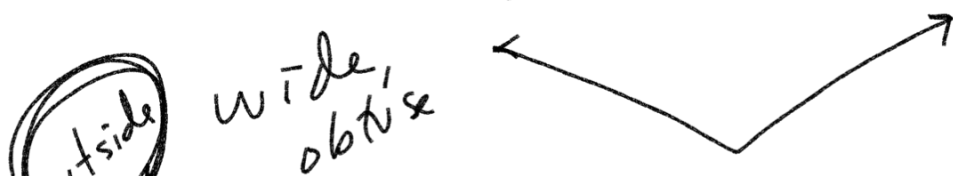
$$y = |a(x-h)| + k$$

\uparrow slope \uparrow $(h,k) = \text{vertex}$

(a) \rightarrow $y = |8(x-1)| + 2$



$a < 1$ $y = |\frac{1}{3}(x-1)| + 2$

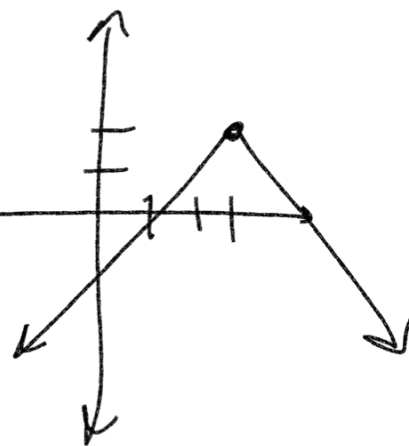


$y = \frac{1}{2}|x-3| + 2$

flip down

factor out the negative

do not flip



$y = |-2x + 4|$

$y = |-2(x-2)|$

do not flip

Quiz 8 HW
due tonight 2-5 evens
2-6 evens
Quiz 9 supplemental
due Nov 8th
Quiz 10 HW 10 (Fri)
due Nov 25th