Name: Answer Key Per: _____ Date: _____
Serafino • Algebra 2E

2-RE 1 Unit 2 – Recap & Exploration

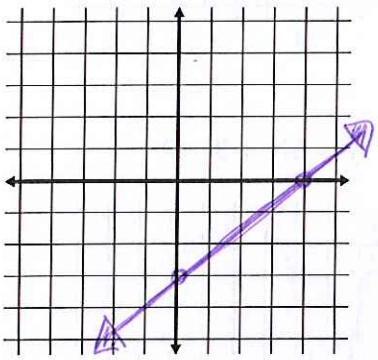
Part 1: Graphing Functions

Part 1: Graphing Functions
- ☐ Graphing Linear Functions
  - ☐ slope–intercept form ☐ point–slope form (2 forms) ☐ standard form ☐ forms requiring conversion
- ☐ Graphing Absolute Value Functions from a function
- ☐ Graphing Piecewise Functions
  - ☐ From a function ☐ From a situation
  - ☐ Putting more complex things in the absolute Value
- ☐ Absolute Value – a step further
  - ☐ Putting more complex things in the absolute Value ☐ Think about Slope vs. Input Growth

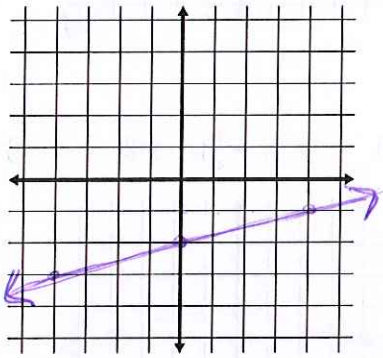
Part 2: Writing Equations of Functions
Part 3: Regressions
Part 4: Analyzing Functions

1. LINEAR FUNCTIONS

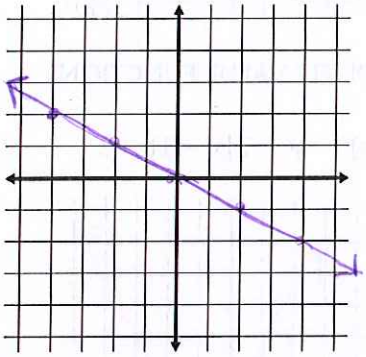
a) $3x - 4y = 12$



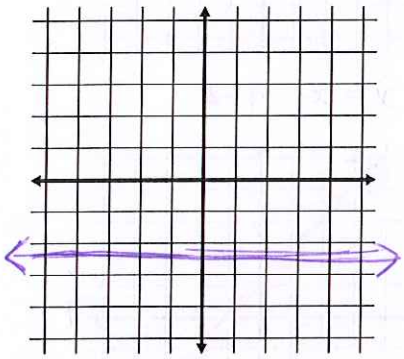
b) $y = \frac{1}{4}x - 2$



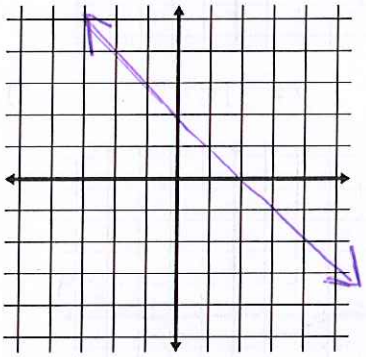
c) $y - 2 = -\frac{1}{2}(x + 4)$



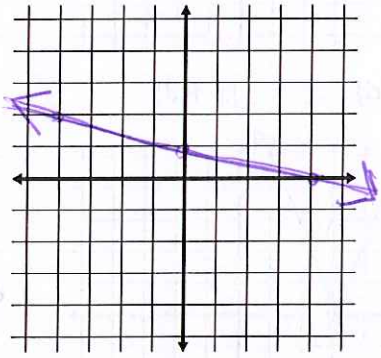
d) $y = -7/3$



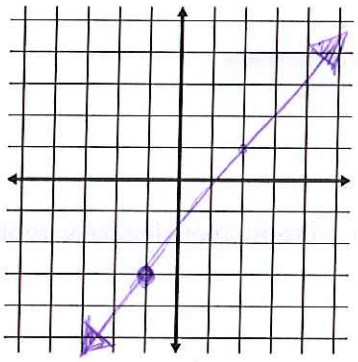
e) $y = 2 - x$



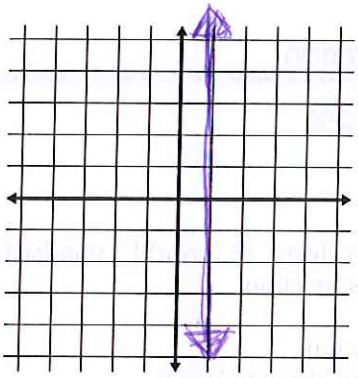
f) $x + 4y = 4$



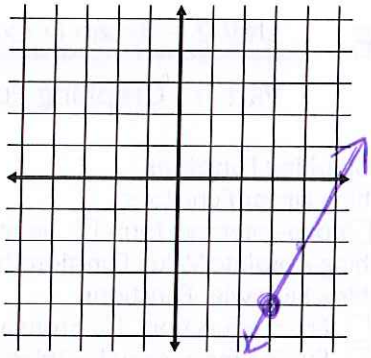
g) $y+3=\frac{4}{3}(x+1)$



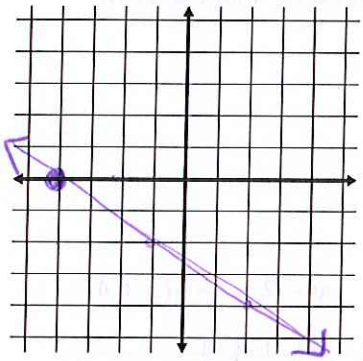
h) $x=1$



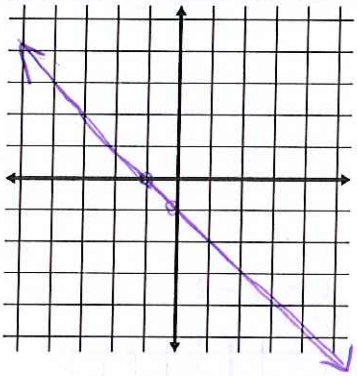
i) $y=2(x-3)-4$



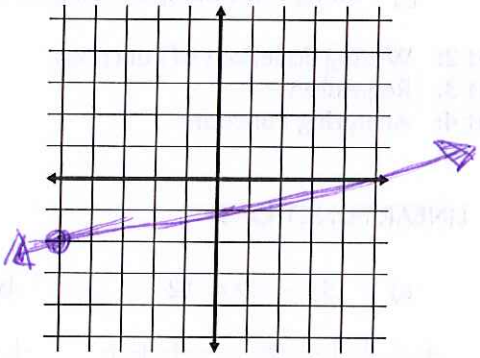
j) $y=-\frac{2}{3}(x+4)$



k) $x+y=-1$

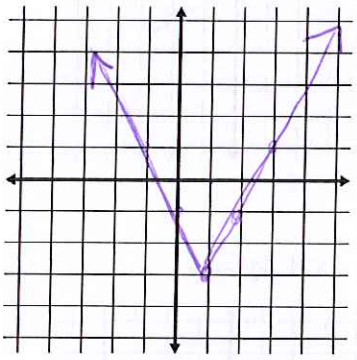


l) $y+2=\frac{1}{5}(x+5)$

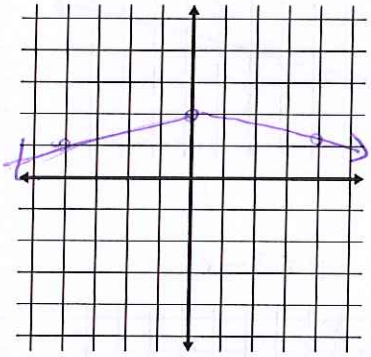


2. ABSOLUTE VALUE FUNCTIONS

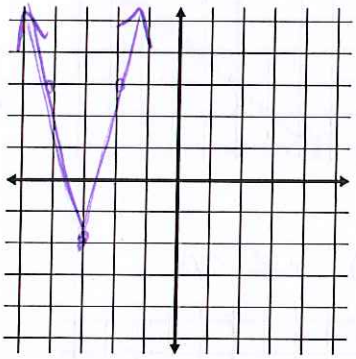
a) $y=2|x-1|-3$



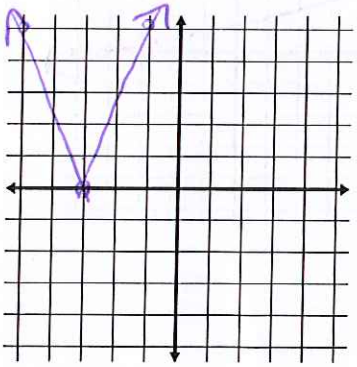
b) $y=-\frac{1}{4}|x|+2$



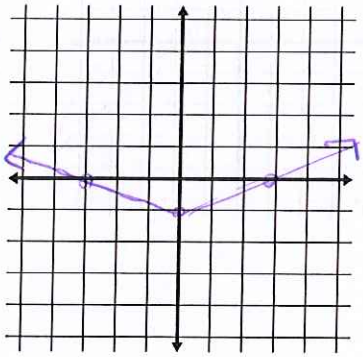
c) $y=5|x+3|-2$



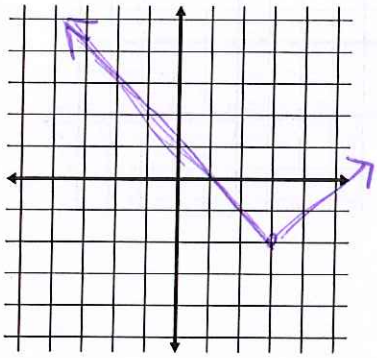
d) $y=\frac{5}{2}|x+3|$



e) $y=\frac{1}{3}|x|-1$

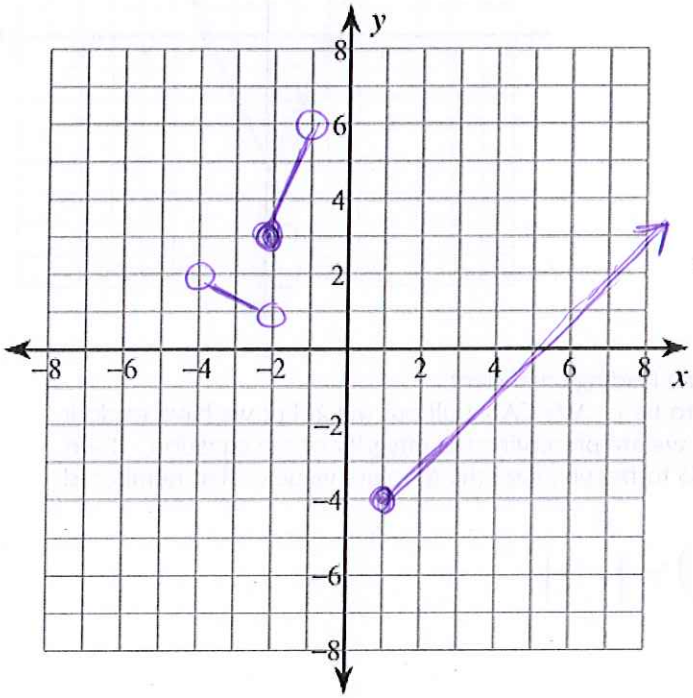


f) $y=|x-3|-2$

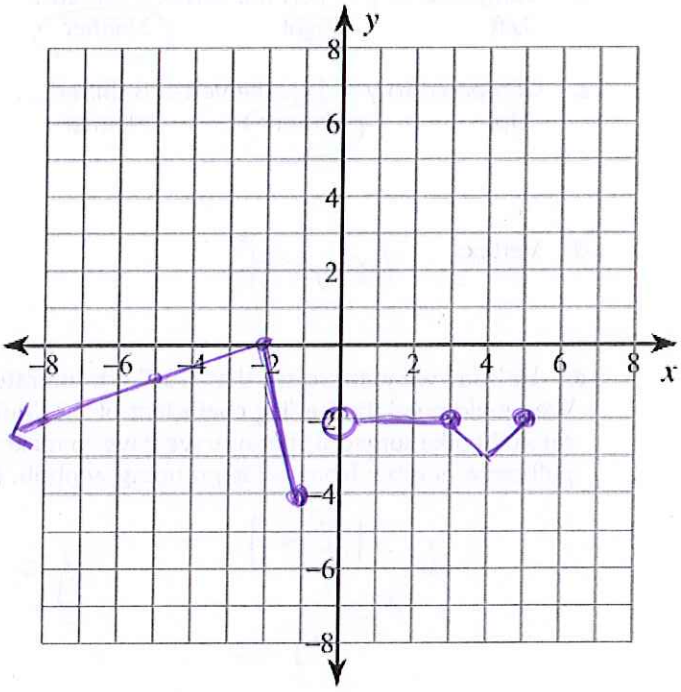


3. PIECEWISE FUNCTIONS

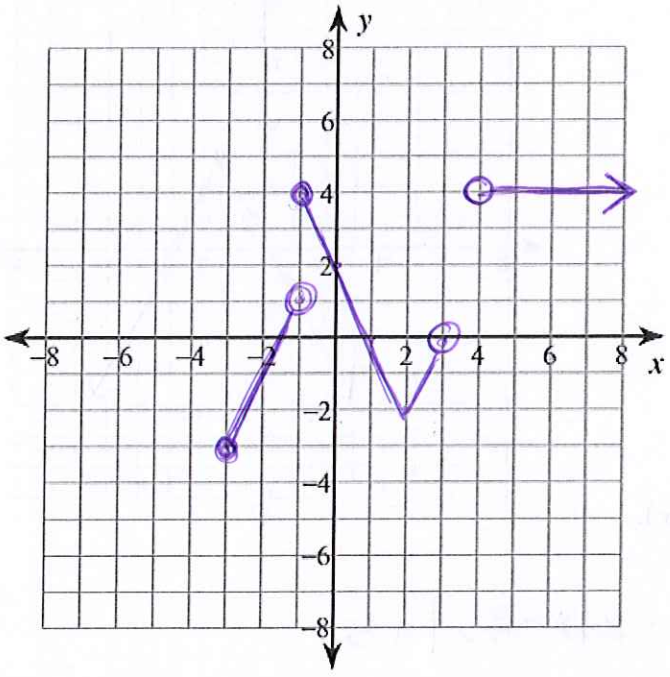
a) $f(x) = \begin{cases} -\frac{1}{2}x, & -4 < x < -2 \\ 3x + 9, & -2 \le x < -1 \\ x - 5, & x \ge 1 \end{cases}$



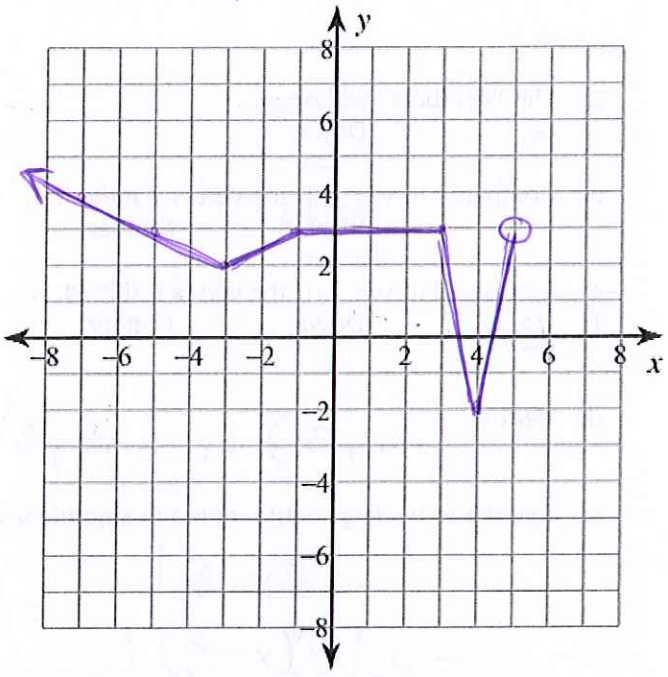
b) $f(x) = \begin{cases} \frac{1}{3}(x+2), & x \le -2 \\ -4x - 8, & -2 \le x \le -1 \\ -2, & 0 < x \le 3 \\ |x-4| - 3. & 3 \le x \le 5 \end{cases}$



c) $f(x) = \begin{cases} 2x + 3, & -3 \le x < -1 \\ 2|x-2| - 2, & -1 \le x < 3 \\ 4, & x > 4 \end{cases}$

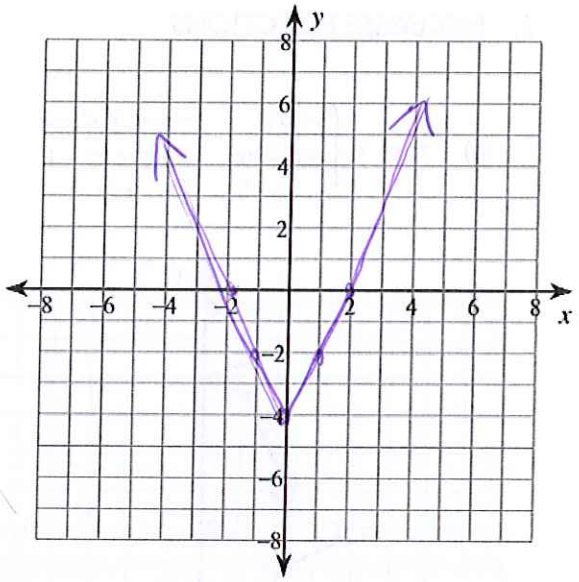


d. $f(x) = \begin{cases} \frac{1}{2}|x+3| + 2, & x \le -1 \\ 3, & -1 \le x < 3 \\ 5|x-4| - 2, & 3 \le x < 5 \end{cases}$



Let's put more complex things in Absolute Value...

4. $y = |2x| - 4$ $y = 2|x|-4$



a. This "varabola" will open....
Up Down

b. Compared to y = |x|, the vertex is shifted...
Left Right Neither

c. Compared to y = |x|, the vertex is shifted....
Up Down Neither

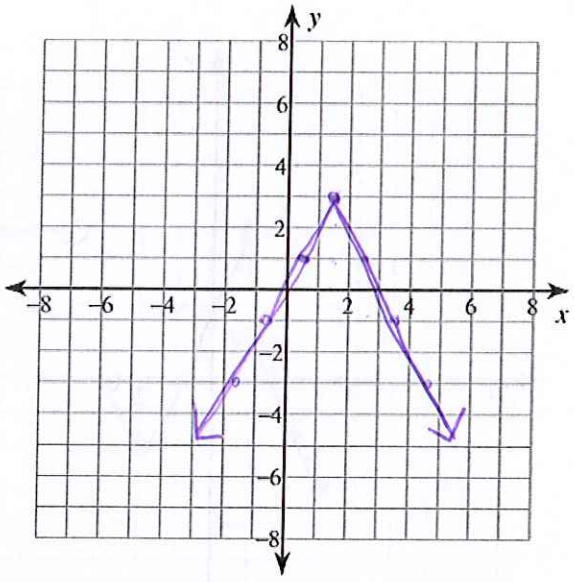
d. Vertex: $(0,-4)$

e. Let's say we want so see the "true" growth rate as the leading coefficient. We would need the leading coefficient of the "inside" to be 1. We CAN pull out the 2, but we have to do it carefully (like surgeons) because we have to make sure we are preserving the integrity of the equation. If we pull out a number from inside grouping symbols, it HAS to be whatever the absolute value of that number is!

$2|2x|$ $y = 2|x|-4$

$|2| = 2$

5. $y = -|2x - 3| + 3$ $= -2|x-3/2|+3$



a. This "varabola" will open....
Up Down

b. Compared to y = |x|, the vertex is shifted...
Left Right Neither

c. Compared to y = |x|, the vertex is shifted....
Up Down Neither

d. Vertex: $(3/2, 3)$ or $(1.5, 3)$

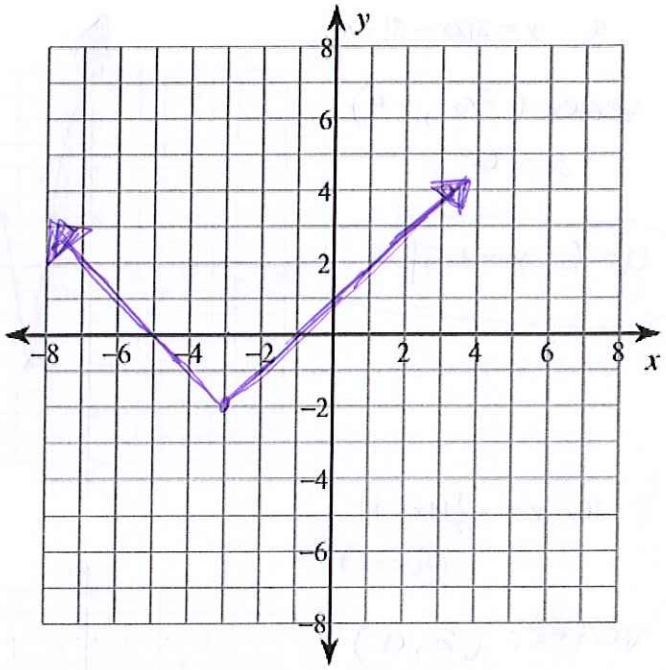
e. Rewrite so leading coefficient in the absolute value is 1.

$|2x-3|$

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

$\frac{1}{2}|(-1)(x+3)|$

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



a. This "varabola" will open....
Up Down

b. Compared to y = |x|, the vertex is shifted...
Left Right Neither

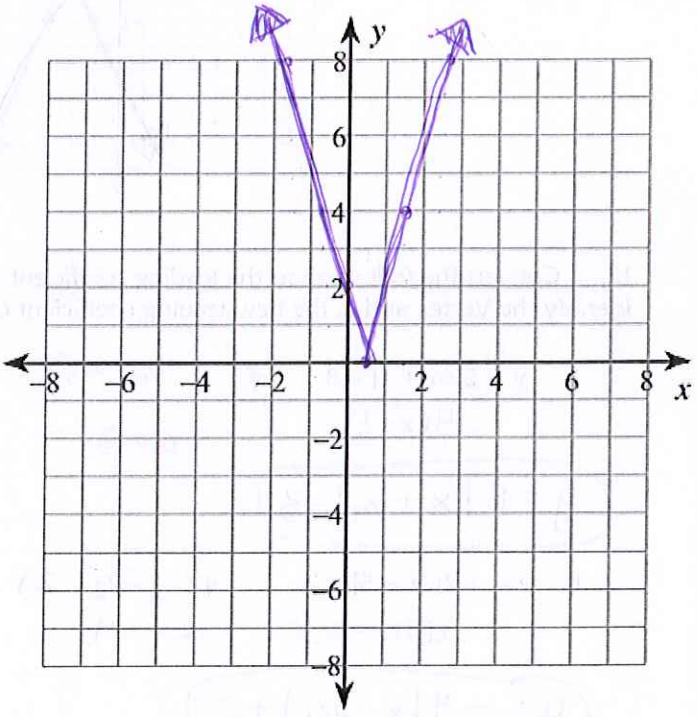
c. Compared to y = |x|, the vertex is shifted....
Up Down Neither

d. Vertex: $(-3, -2)$

7. $y = |2 - 4x|$ y = $4|x - \frac{1}{2}|$

$|-4x+2|$

$|(-4)(x - \frac{1}{2})|$



a. This "varabola" will open....
Up Down

b. Compared to y = |x|, the vertex is shifted...
Left Right Neither

c. Compared to y = |x|, the vertex is shifted....
Up Down Neither

d. Vertex: $(\frac{1}{2}, 0)$

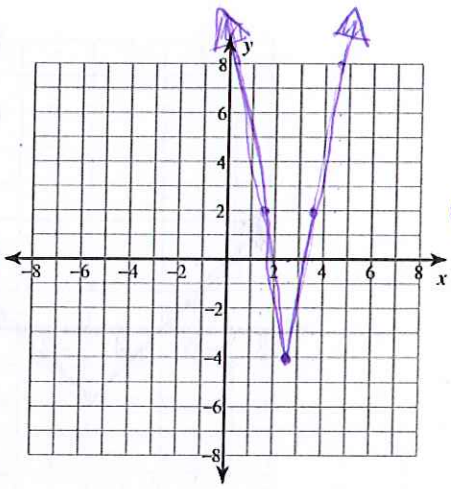
Practice: Convert the following so the leading coefficient of the expression inside the absolute value symbol is 1. Identify the (h, k) Vertex and *a*, the new leading coefficient of your function. Verify by graphing on a graphing calculator, if necessary.

8. $y = 3|2x - 5| - 4$

Vertex $(5/2, -4)$

$a = 6$

$y = 6|x - 2.5| - 4$



9. $y = 3|7 - 2x|$

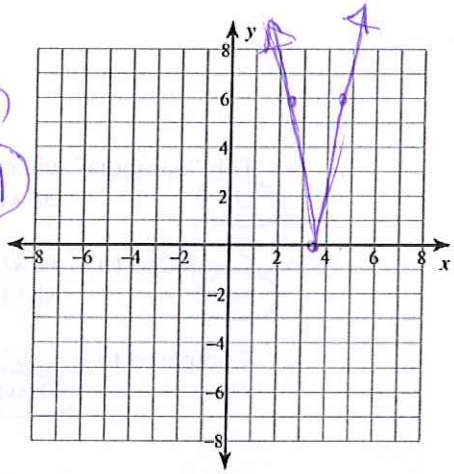
$-2x + 7$

$-2(x - 7/2)$

$y = 6|x - 3.5|$

$V: (7/2, 0)$

$a = 6$



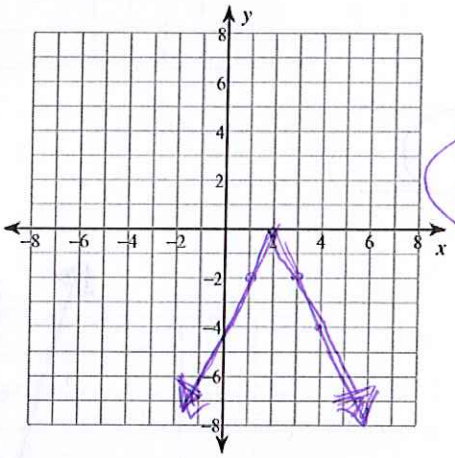
10. $y = -\frac{1}{2}|4x - 8|$

$4(x - 2)$

vertex: $(2, 0)$

$a = -2$

$y = -2|x - 2|$



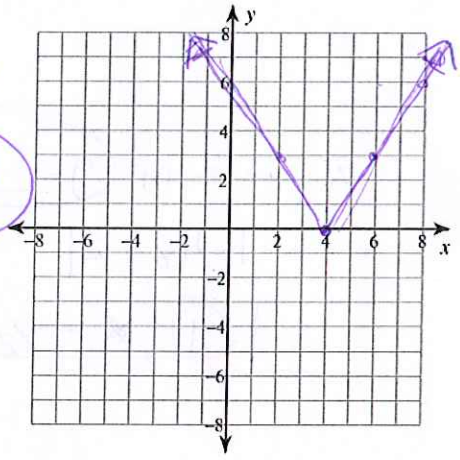
11. $y = \frac{3}{4}|-8 + 2x|$

$2x - 8$

$2(x - 4)$

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

$a = 3/2$



12. Convert the following so the leading coefficient of the expression inside the absolute value symbol is 1. Identify the Vertex and *a*, the new leading coefficient of your function.

a. $y = 2|4x + 1| - 3$ $V: (-1/4, -3)$

$4(x + 1/4)$ $a = 8$

$y = 8|x + 1/4| - 3$

b. $y = -2|2x - 5| + 2$ $V: (5/2, 2)$

$-2(x - 5/2)|$ $a = -4$

$y = -4|x - 5/2| + 2$

c. $y = \frac{1}{2}|8x + 3|$ $V: (-3/8, 0)$

$8(x + 3/8)$ $a = 4$

$y = 4|x + 3/8|$

d. $y = \frac{1}{3}|-9x|$ $V: (0, 0)$

$-9 \cdot x|$ $a = 3$

$y = 3|x|$

e. $y = \frac{1}{2}|5 - x|$ $V: (5, 0)$ $a = \frac{1}{2}$

$-x + 5$

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

f. $y = -\frac{2}{5}|4x + 3|$ $V: (-3/4, 0)$

$4(x + 3/4)$ $a = -8/5$

$y = -\frac{8}{5}|x + 3/4|$