The Absolute Value Function

Name _Master G_
Date _M_____ Block _____

The Parent Function: f(x) = |x|
...*where* a = 1; h = 0; k = 0

Graphic Form of the Function
f(x) = a|x – h| + k

Translations
The VERTEX is (h, k)
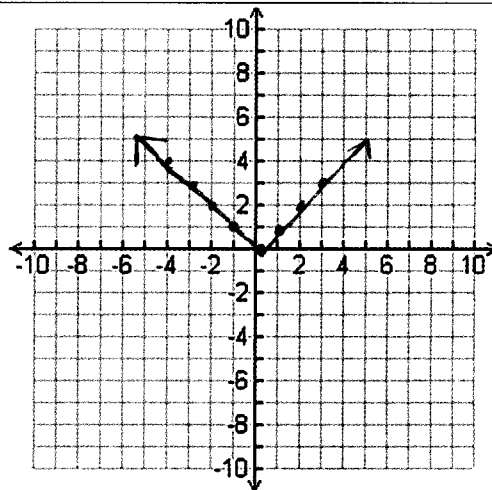-h shifts f(x) to the left h units
+h shifts f(x) to the right h units
k shifts f(x) up k units
-k shifts f(x) down k units

Reflections & Dilations
"a" is the "rate" of f(x)
+a opens upward
-a opens downward
0 < a < 1 vertical compression
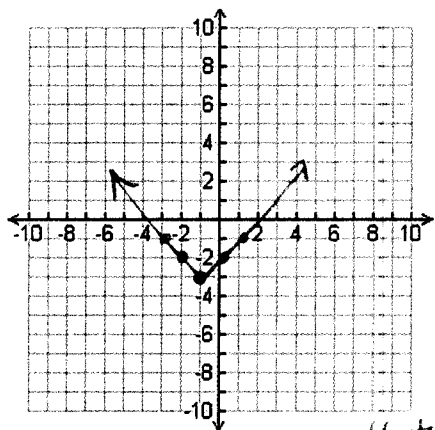a > 1 vertical stretch

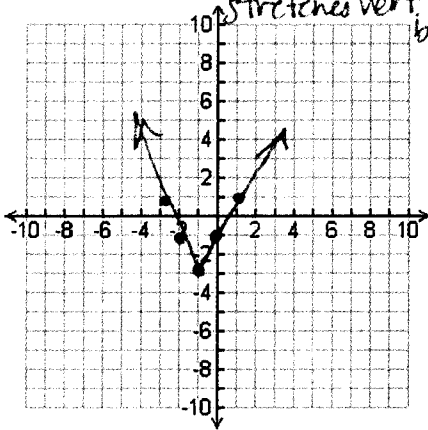| x	y = f(x)
0	0
1	1
2	2
3	3
4	4
-1	1
-2	2
-3	3
-4	4

State the vertex and describe the dilation and/or refection BEFORE you graph each function.

Do not use a calculator!
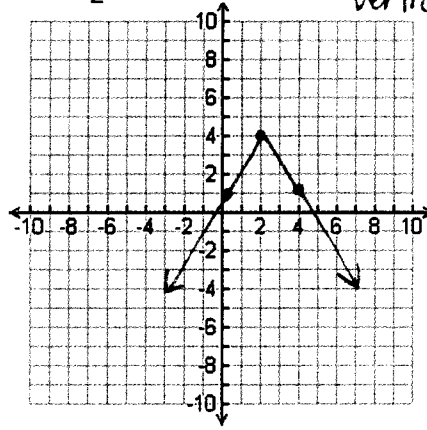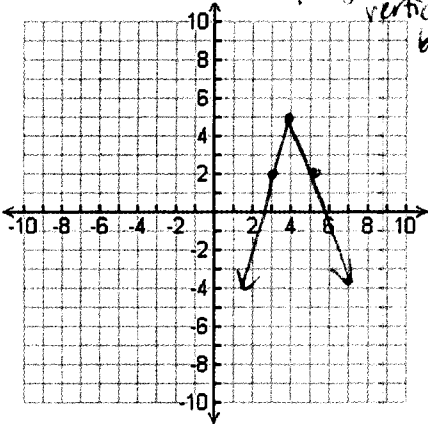
1. y = |x + 1| – 3   (-1, -3)

2. y = 2|x + 1| – 3   (-1, -3)   stretches vert by 2
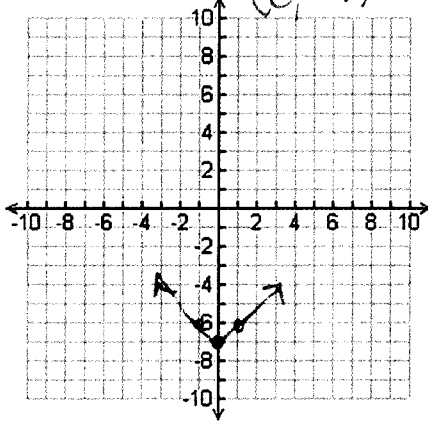

3. y = -\frac{3}{2}|x – 2| + 4   (2, 4)   reflects over x-axis compresses vertically
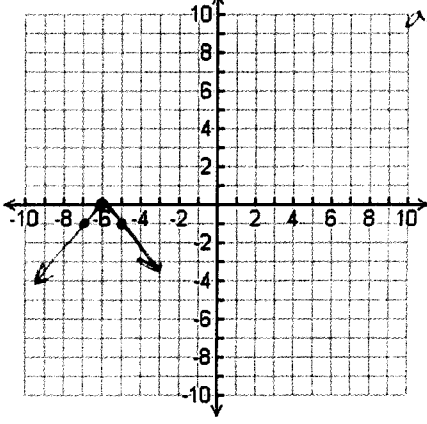
$y = -\frac{3}{2}|x - 2| + 4$

4. y = -3|x – 4| + 5   (4, 5)   reflects over x-axis stretches vertically by 3

5. f(x) = |x| – 7   Shifts down 7   (0, -7)

6. f(x) = -|x + 6| (-6, 0)   Reflects over x-axis

The Identity / Linear Function

Name _Harter C_
Date _____ Block _____

The Parent Function: $f(x) = x$
...where $a = 1; h = 0; k = 0$

Graphic Form of the Function

$$f(x) = a(x - h) + k$$

which is the same as...

Point-Slope $y = m(x - x_1) + y_1$

Three forms of a Linear Function:
- Slope-Intercept: $y = mx + b$
- Standard: $Ax + By = C$
- Point-Slope: $y = m(x - x_1) + y_1$

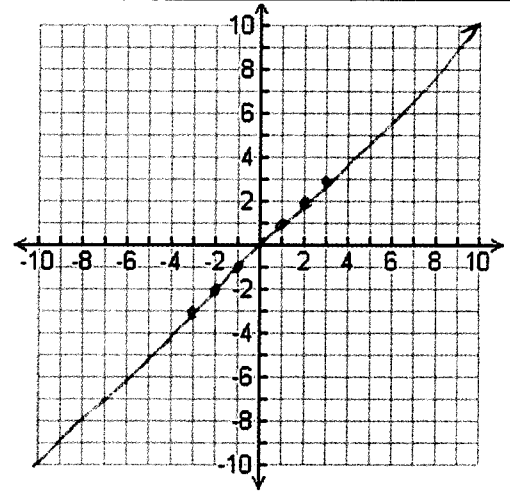
<u>Translations</u>
The VERTEX is (h, k)
-h shifts f(x) to the left h units
+h shifts f(x) to the right h units
k shifts f(x) up k units
-k shifts f(x) down k units

<u>Reflections & Dilations</u>
"a" is the "rate" of f(x)
+a rises
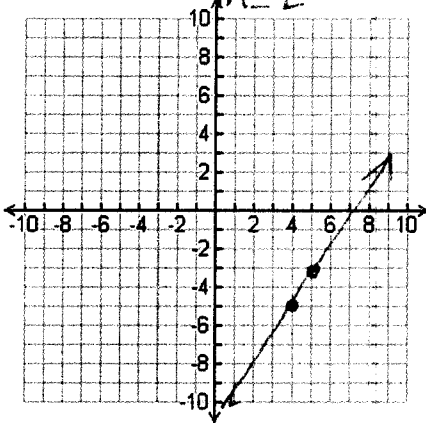-a falls
$0 < a < 1$ vertical compression
$a > 1$ vertical stretch

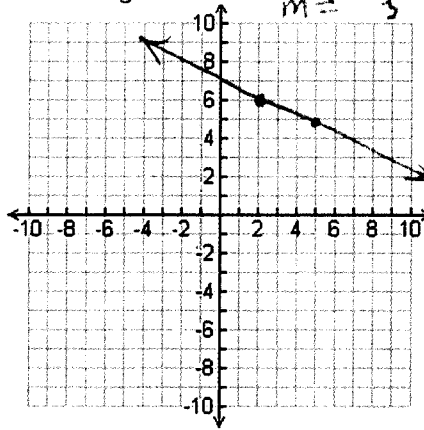| x	y = f(x)
-4	-4
-3	-3
-2	-2
-1	-1
0	0
1	1
2	2
3	3
4	4

State a point and the slope BEFORE you graph each line. Do not use a calculator!
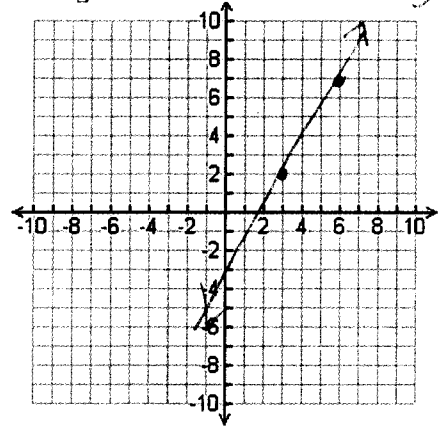
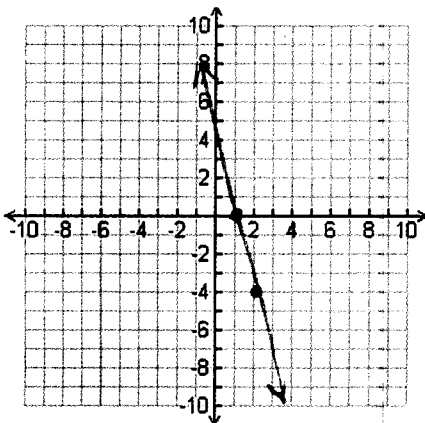**1.** $y = 2(x - 4) - 5$ $(4, -5)$ $m = 2$

2. $y = -\frac{1}{3}(x + 2) + 6$ $(-2, 6)$ $m = -\frac{1}{3}$
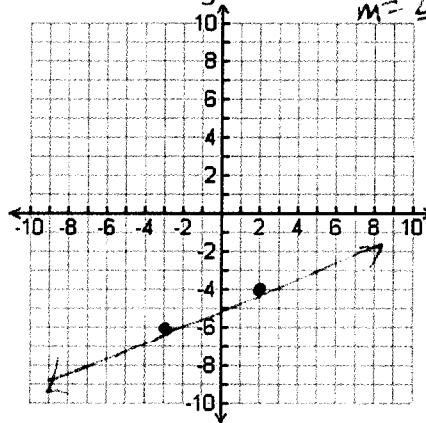

3. $y = \frac{5}{3}(x - 3) + 2$ $(3, 2)$ $m = \frac{5}{3}$

4. $f(x) = -4(x - 1)$ $(1, 0)$ $m = -4$

5. $f(x) = \frac{2}{5}(x + 3) - 6$ $(-3, -6)$ $m = \frac{2}{5}$

6. $y = -5$ $(0, -5)$ $m = 0$