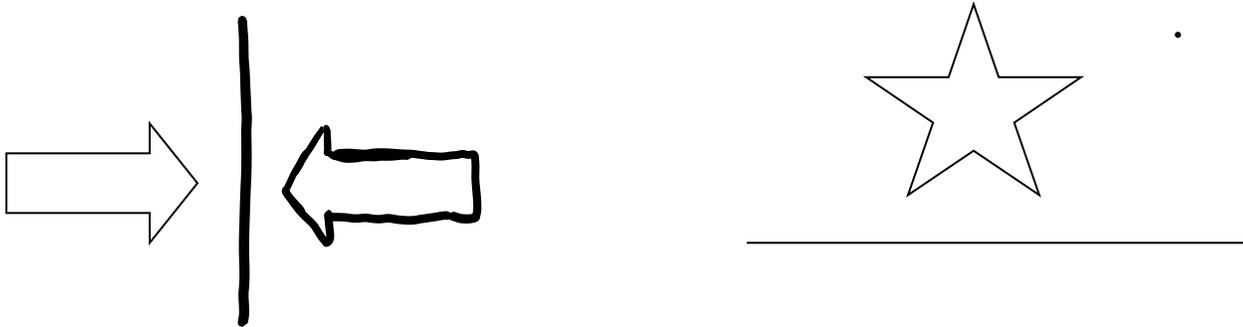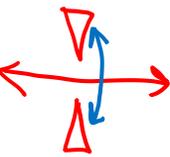# REFLECTIONS

DAY 1

To 'reflect' a graph means to draw its **mirror** **image** across a line of symmetry.

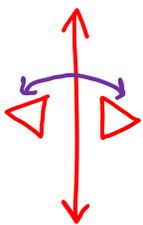**Examples:** Draw the reflection of the given figures across the line of symmetry.

There are two ways to that we will reflect graphs on a coordinate plane.

1) Across the **X** axis. This means we will be changing the **y** values by taking their **opposite**.

The notation will look like this: $-f(x)$ negative is out front

Other examples: $-x^2$; $-|x|$; *etc.*

2) Across the **y** axis. This means we will be changing the **X** values by taking their **opposite**.

The notation will look like this: $f(-x)$ negative is inside the parentheses or bars

Other examples: $(-x)^2$; $|-x|$; *etc.*

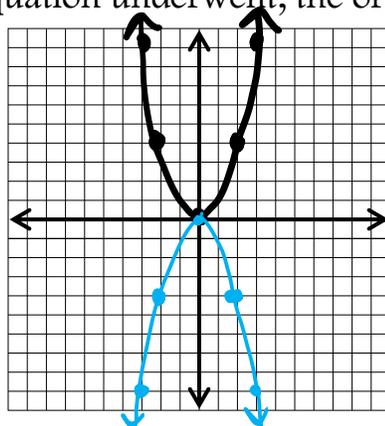Practice makes perfect ... For each of the following graphs, you have been given f(x). List the transformation that the new equation underwent, the original points, and the new points.

1) $f(x) = x^2$

New Equation: $-f(x) = -x^2$

Transformation:
- reflection over x
- take opposite of y

Original Points:
(0, 0)
(-2, 4)
(2, 4)
(-3, 9)
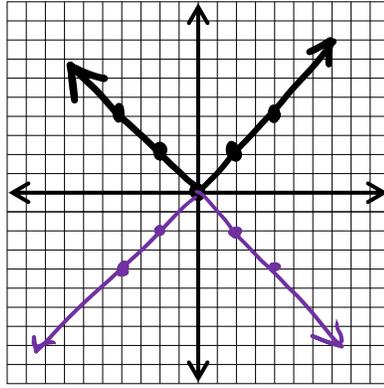(3, 9)

New Points:
(0, 0)
(-2, -4)
(2, -4)
(-3, -9)
(3, -9)

↖ opposite

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

New Equation: $-f(x) = -|x|$

Transformation:
- reflection over X
- opposite of Y

Original Points:
(0,0)
(-2,2)
(-4,4)
(2,2)
(4,4)
← opposite

New Points:
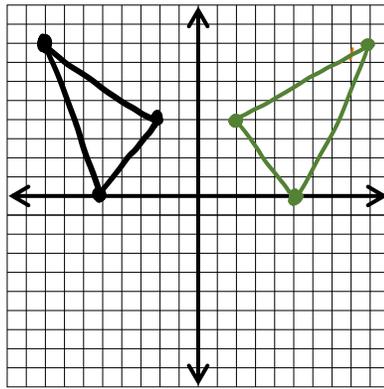(0,0)
(-2,-2)
(-4,-4)
(2,-2)
(4,-4)

3) Original Equation: $f(x)$

New Equation: $f(-x)$

Transformation:
- reflection over y
- opposite of X

Original Points:
(-5,0)
(-2,4)
(-8,8)
opposite

New Points:
(5,0)
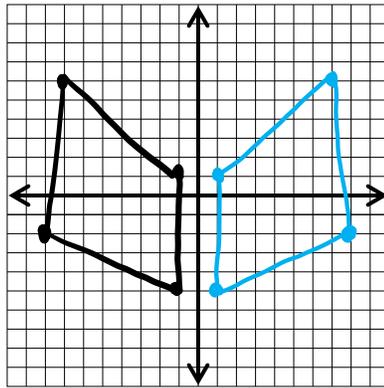(2,4)
(8,8)

4) Original Equation: $f(x)$

New Equation: $f(-x)$

Transformation:
- reflection over y
- opposite of X

Original Points:
(-8,-2)
(-7,6)
(-1,1)
(-1,-5)
opp.

New Points:
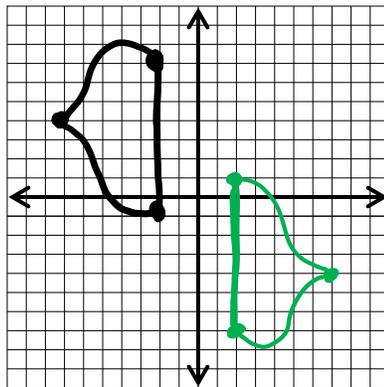(8,-2)
(7,6)
(1,1)
(1,-5)

5) Original Equation: $f(x)$

New Equation: $-f(-x)$

Transformations:
- reflection over X and y
- opposite of y and X

Original Points:
(-2,-1)
(-7,4)
(-2,7)
opp   opp

New Points:
(2,1)
(7,-4)
(2,-7)