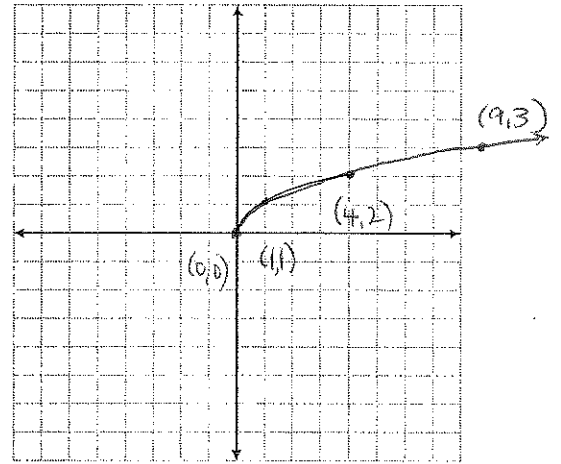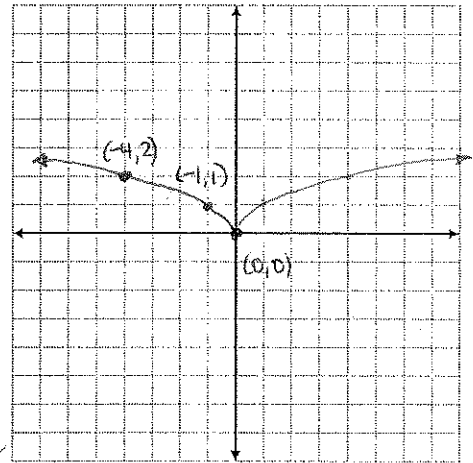Pre–Calculus 12

Name _____

4.2 – Reflecting Graphs of Functions

Block _____

Consider the graph of $y = \sqrt{x}$. Label 3 different coordinates.

a) Replace "x" with "$-x$" and re-graph.
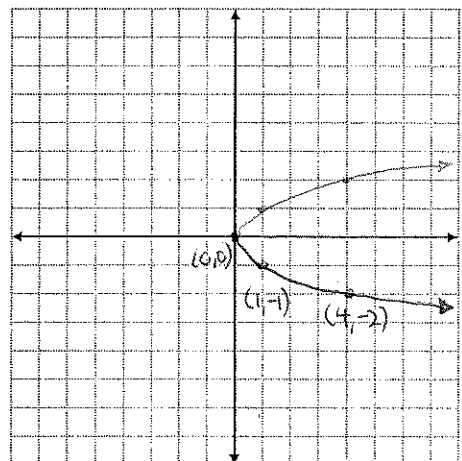
$$y = \sqrt{-x}$$

Result (of graph): horizontal reflection in y-axis

Result (of coordinates): all x-values become negative

b) Replace "y" with "$-y$" and re-graph.
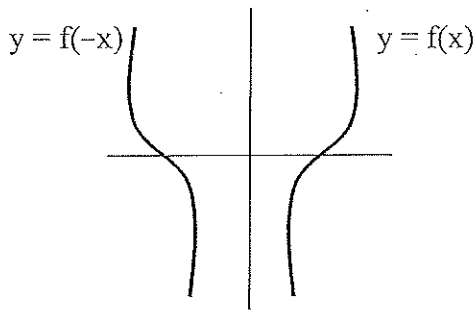
$$-y = \sqrt{x}$$

$$\Rightarrow y = -\sqrt{x}$$

Result (of graph): vertical reflection in x-axis

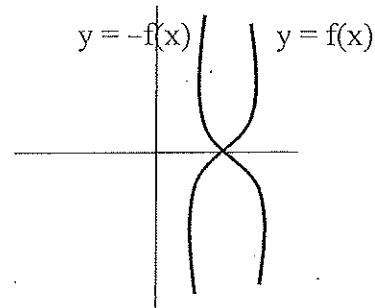Result (of coordinates): all y-values become negative

In General:

If you replace x with –x,

$y = f(-x)$ $y = f(x)$

there is a **horizontal reflection**
in the **y – axis**.

If you replace y with –y,

$y = -f(x)$ $y = f(x)$
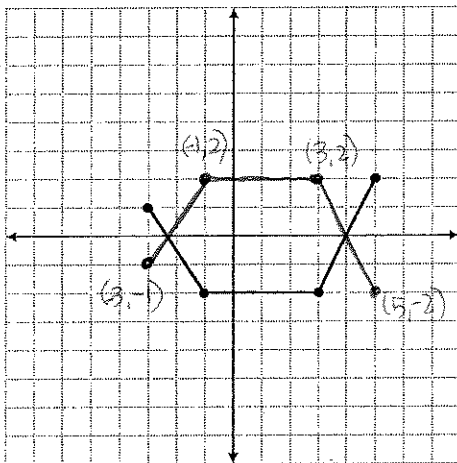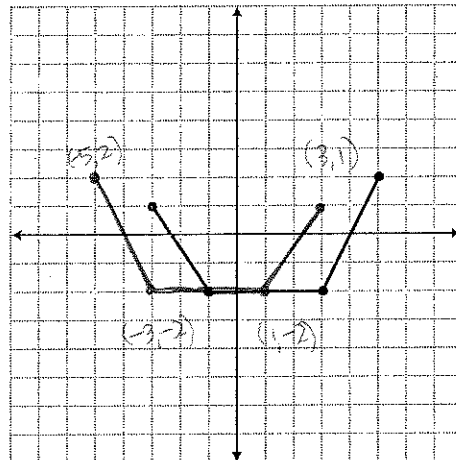
there is a **vertical reflection**
in the **x – axis**.

Example #1: Here is the graph of $y = g(x)$. On the same grid, also graph:

a) $y = -g(x)$ y-values change

b) $y = g(-x)$ x-values change

Result: vertical reflection in x-axis   Result: horizontal reflection in y-axis

Example #2: If the point $y = (4, -2)$ is on the graph of $y = g(x)$, find the corresponding point on the graph of:

a) $y = -g(x)$

vertical in x-axis
⇒ y-values change

$(4, 2)$

b) $y = -g(-x)$

vertical and horizontal
⇒ x and y-values change

$(-4, 2)$

Homework: p. ~~183 #3-13~~ p. 211 # 3-11