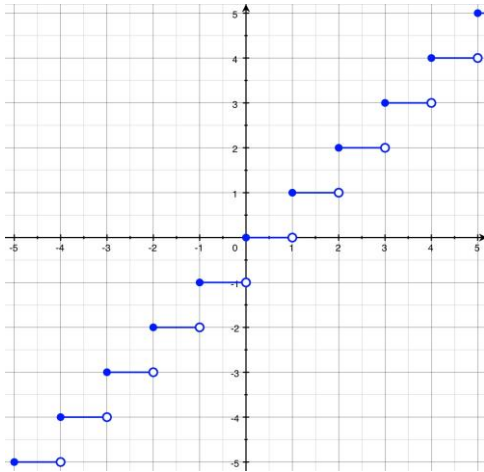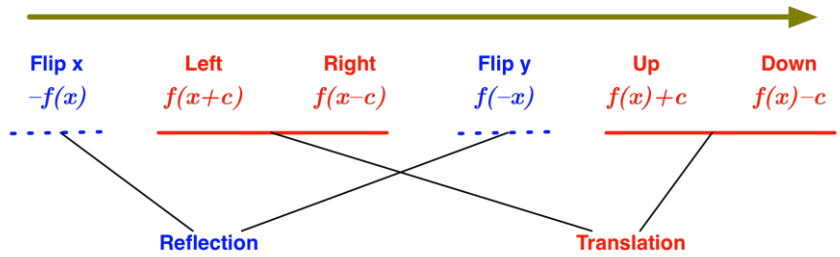# TECHNIQUES IN GRAPHING

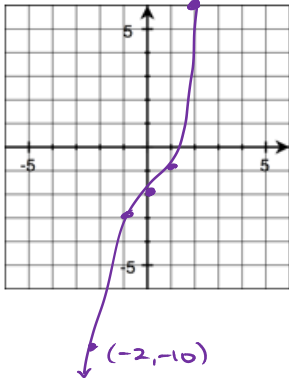## THE 7TH MOTHER FUNCTION:

The Greatest Integer Function (Also called the Floor Function or the Step Function.)

$y = \lfloor x \rfloor$
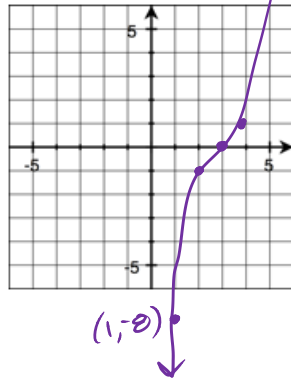
Domain: $(-\infty, \infty)$
Range: Integers $\mathbb{Z}$

Use the Mother Functions on **page 149,** the 7th Mother Function shown at left, and the order of operations shown below to complete the examples.
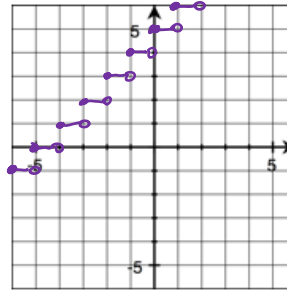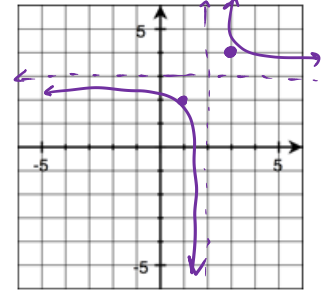
Flip x	Left	Right	Flip y	Up	Down
$-f(x)$	$f(x+c)$	$f(x-c)$	$f(-x)$	$f(x)+c$	$f(x)-c$

Reflection   **Translation**

$y = x^3 - 2$
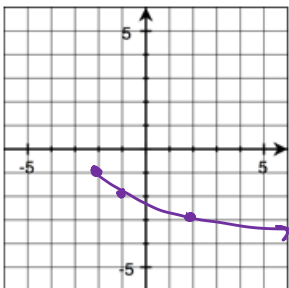
$(-2,-10)$

$y = (x-3)^3$ $(5,8)$

$(1,-8)$
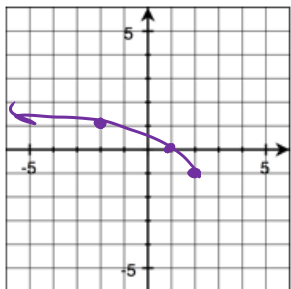
$y = \lfloor x+1 \rfloor + 4$
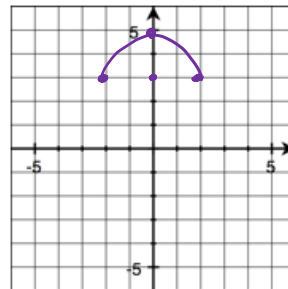
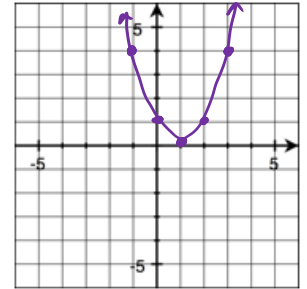$y = \dfrac{1}{x-2} + 3$

$y = -\sqrt{x+2} - 1$

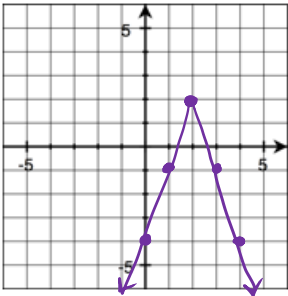$y = \sqrt{2-x} - 1$
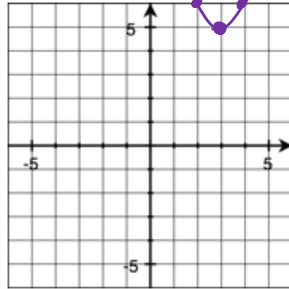$y = \sqrt{-(x-2)} - 1$

$y = 3 + \sqrt{4 - x^2}$

$y = (1-x)^2$
$(-(x-1))^2$
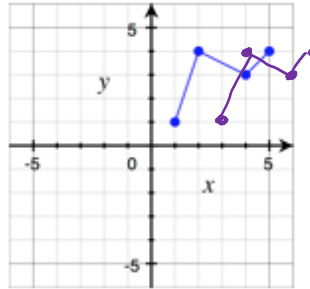
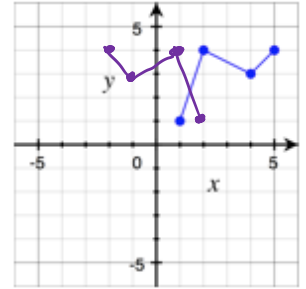$y = -3|x - 2| + 2$ $y = (x - 3)^2 + 5$ $f(x - 2)$ $f(-x + 3)$
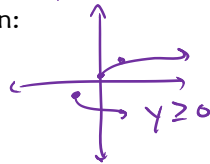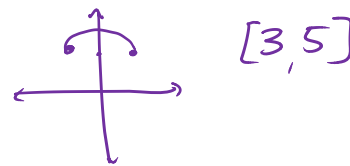$-(x - 3)$

Find the range for the function:

1) $y = -\sqrt{x + 2} - 1$

$y \leq -1$

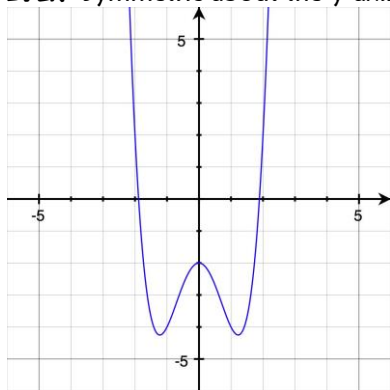$(-\infty, -1]$

$y \geq 0$

2) $y = 3 + \sqrt{4 - x^2}$

$[3, 5]$

3) For the point (2, -4) that lies on the graph of f, find the new coordinate on the translated function of f:

$$-2f(x - 1) - 2$$

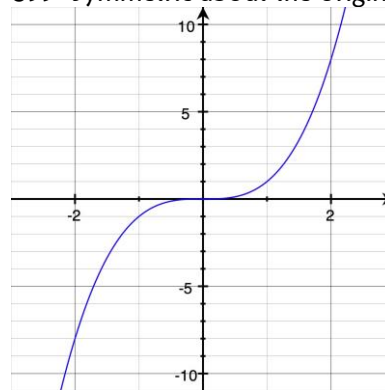$(2, -4) \longrightarrow (2, 8) \longrightarrow (3, 8) \longrightarrow (3, 6)$

Δy_1 Δx Δy_2

EVEN AND ODD FUNCTIONS

EVEN: Symmetric about the y-axis and $f(-x) = f(x)$

ODD: Symmetric about the origin and $f(-x) = -f(x)$

Which of the Mother Functions are even? Odd? Neither?

Even	Odd	Neither
$y = x^2$	$y = x^3$	$y = \sqrt{x}$
$y = |x|$	$y = \frac{1}{x}$	
$y = \sqrt{1 - x^2}$		