Integrated Math 2   Date: _____
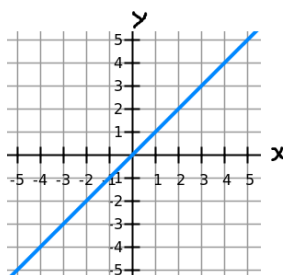
5D – Function Transformations

❖ Vocabulary, Formulas, Theories:
- **Parent Function**: the simplest form of a function that can be used as a starting point or building block.
- **Slope Intercept Form**: an algebraic representation of a line. It's written as $y = mx + b$ where m is slope and b is the y-intercept. The parent function is $y = x$.
- **Vertex Form of a Quadratic**: an algebraic representation of a parabola. When the parabola opens up or down, it's written as $y = a(x - h)^2 + k$ where $a \neq 0$ and the vertex is (h, k). The parent function is $y = x^2$.
- **Exponential Form:** an algebraic representation of an exponential. It's written as $y = a \cdot b^{(x-h)} + k$ where $a > 0$, h controls horizontal movement, and k controls vertical movement. The parent function is $y = 2^x$.
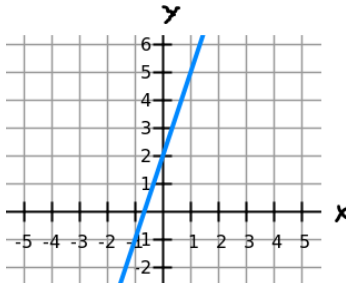

▶ Video - "Linear Transformations - Example" - MathontheWeb (5:26)

EX1) Describe the transformation from function 1 to function 2.

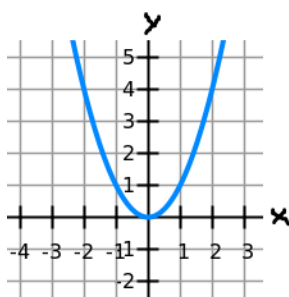a)   *Function 1*   *Function 2*

b) $f_1(x) = x$; $f_2(x) = -\dfrac{1}{2}x - 3$

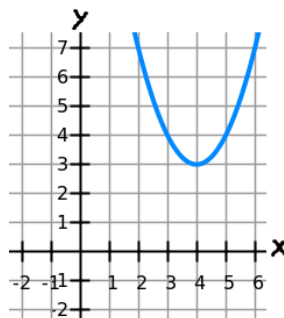
▶ Video - "Exploring Vertex Form" - MathontheWeb (4:40)

▶ Video - "Quadratic Transformations - Example 1" - MathontheWeb (4:28)

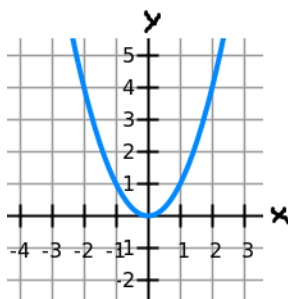EX2) Write the equation that represents the transformation from function 1 to function 2.
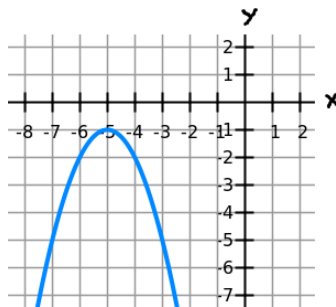
a)   *Function 1*   *Function 2*

b)   *Function 1*   *Function 2*

EX3) Describe the transformation from function 1 to function 2.

    a) $f_1(x) = x^2$; $f_2(x) = -(x-2)^2 - 4$

    b) $f_1(x) = (x+1)^2 + 2$; $f_2(x) = 2(x-1)^2 - 3$

EX4) Write the function that represents the result of the transformation.

    a) Transform $f_1(x) = x^2$ by 3 units right and 2 units down.

    b) Transform $f_1(x) = (x-3)^2 - 4$ by 4 units left, 3 units up, and flipped.

EX5) Describe the transformation from function 1 to function 2.

    a) $f_1(x) = 2^x$; $f_2(x) = 2^{(x+3)}$

    b) $f_1(x) = 3^{(x+2)}$; $f_2(x) = 3^{(x+5)} - 2$

EX6) Write the function that represents the result of the transformation.

    a) Transform $f_1(x) = 2^x$ by 2 units left and 3 units down.

    b) Transform $f_1(x) = 3^{(x-2)} - 4$ by 2 units right and 5 units up