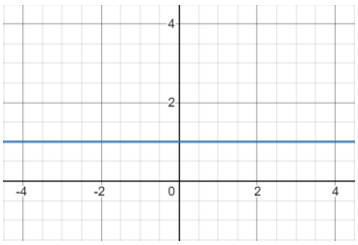
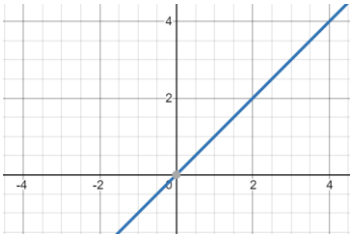
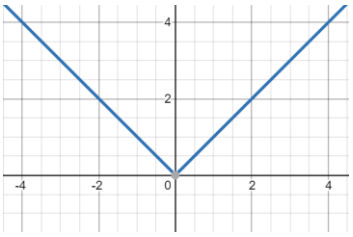
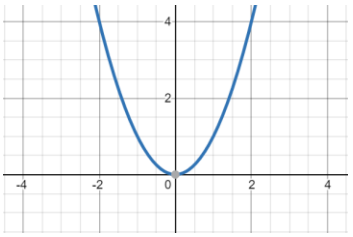
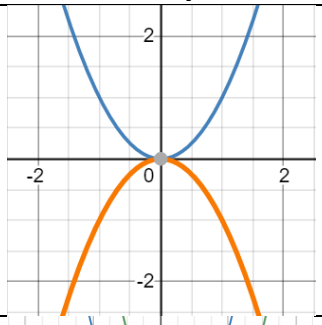
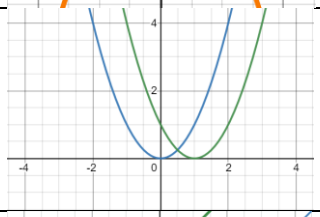
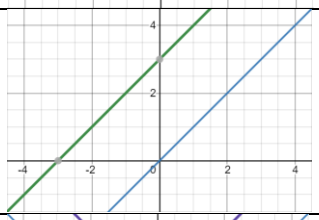
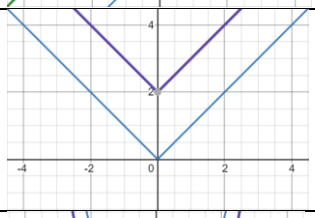
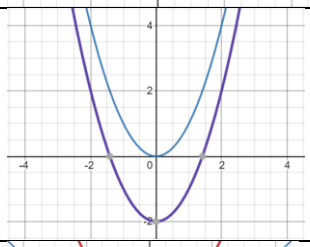
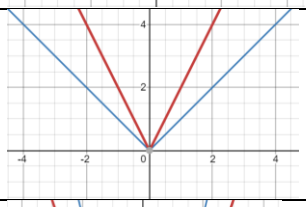
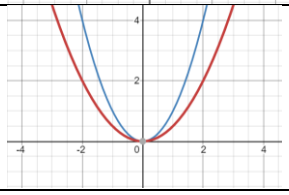
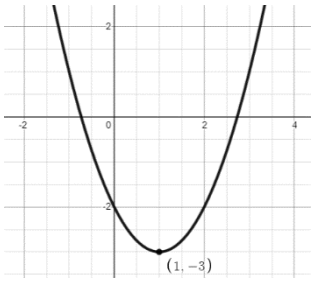
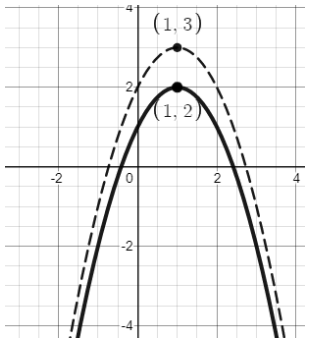
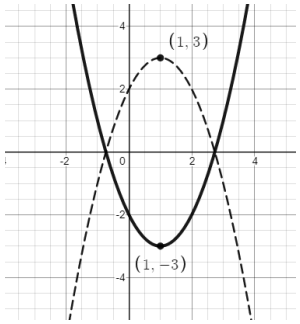
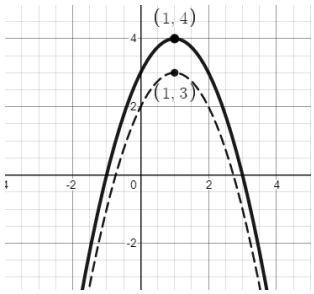
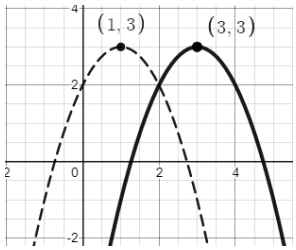
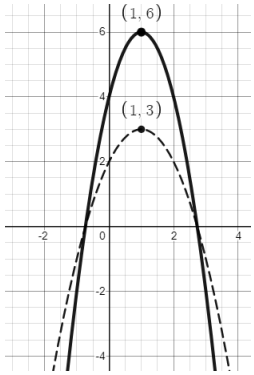
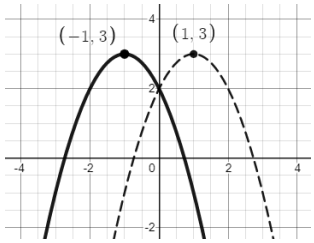
Unit 3. Section 3. Transformations.

Review from Section 2.

Family Name	Parent Function	Graph	Characteristics
Constant	$f(x) = 1$		The graph is a horizontal line. Domain: all real numbers Range: one value
Linear	$f(x) = x$		The graph is a slanted line (not horizontal, not vertical) Domain: all real numbers Range: all real numbers.
Absolute Value	$f(x) = \lvert x \rvert$		The graph is V-shaped. Domain: all real numbers. Range: $[0, \infty)$
Quadratic	$f(x) = x^2$		The graph is U-shaped, it is called a parabola. Domain: all real numbers Range: $[0, \infty)$

Function Transformations

Transformation		Graph	Equation
Reflection			$f(x) \to -f(x)$
Horizontal Translation	Move Right		$x \to x - b$
	Move Left		$x \to x + b$
Vertical Translation	Move Up		$f(x) \to f(x) + a$
	Move Down		$f(x) \to f(x) - a$
Vertical Dilation	Vertical Stretch		$f(x) \to df(x), d > 1$
	Vertical Compression		$f(x) \to cf(x), c < 1$

Transformation	Graph	Transformation	Graph
None. $f(x) = -x^2 + 2x + 2$		Vertical translation 1 unit down.	
Reflection over the x-axis.		Vertical translation 1 unit up.	
Horizontal translation 2 units to the right.		Vertical stretch by a factor of 2.	
Horizontal translation 2 units to the left.		Vertical compression by a factor of 2.