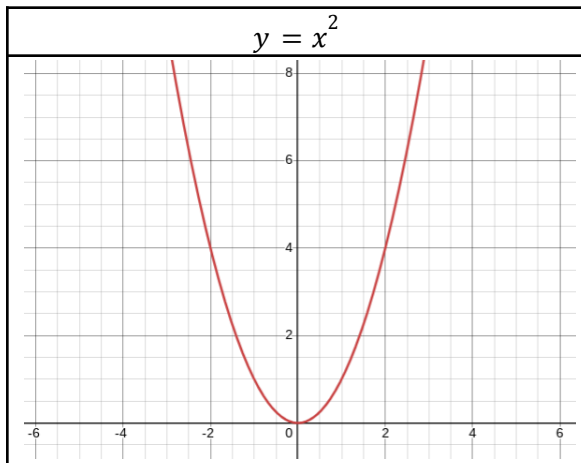# Polynomial Functions (Vertex Form)

$$y = x^2$$

A **polynomial function** is a function that contains a variable raised to the power of a constant. The general form of a polynomial function is:

$$y = x^n$$

Where n is the degree of the polynomial

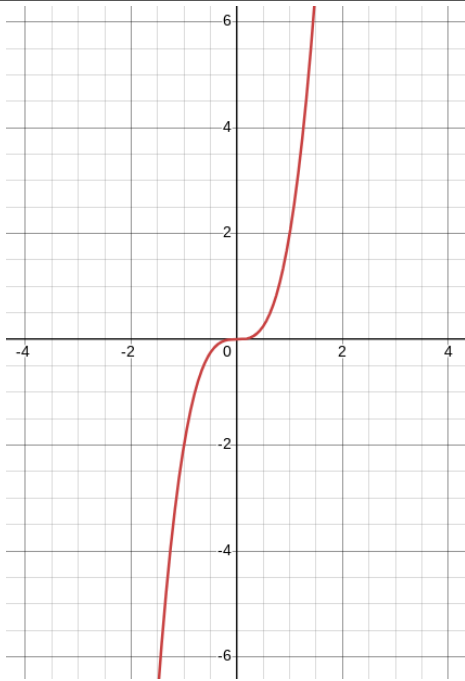The general transformed polynomial functions is:

$$y = a * (x - h)^n + k$$

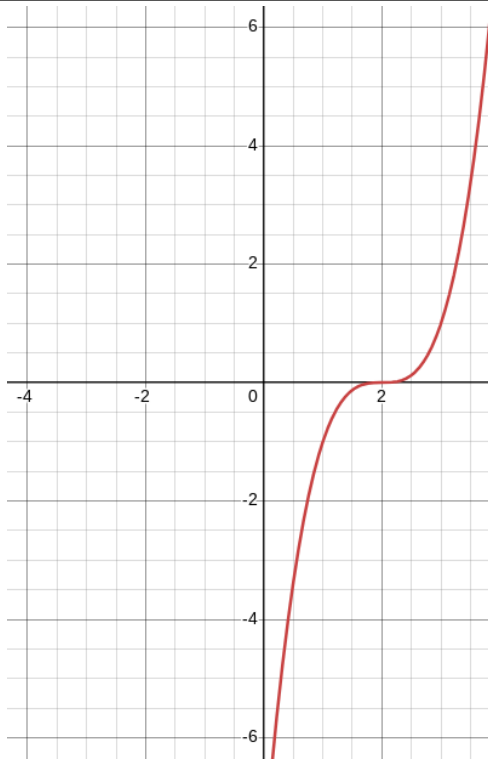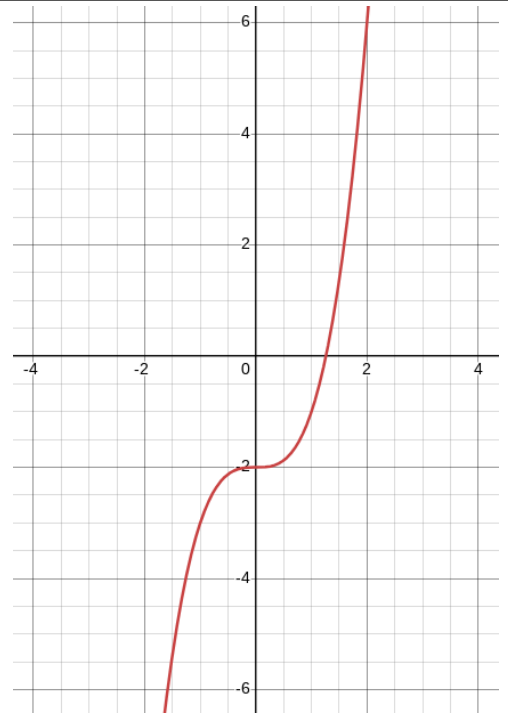| Quadratic Examples		
$y = 2x^2$	$y = (x - 2)^2$	$y = x^2 + 2$
If $\lvert a \rvert > 1$, the graph is vertically stretched. If $0 < \lvert a \rvert < 1$, the graph is vertically compressed. If $a < 0$, the graph is reflected over the x-axis.	If $h > 0$, the graph shifts to the right. If $h < 0$, the graph shifts to the left. *note that the h is being subtracted; in the above expression $h = 2$	If $k > 0$, the graph shifts up. If $k < 0$, the graph shifts down.

Polynomial Functions (Vertex Form)

Cubic Examples
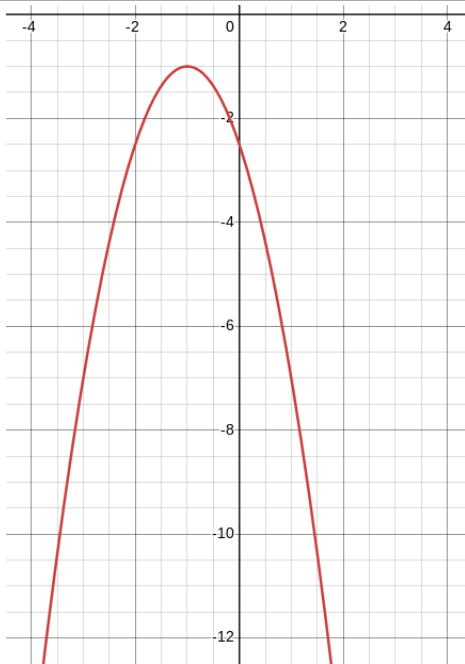
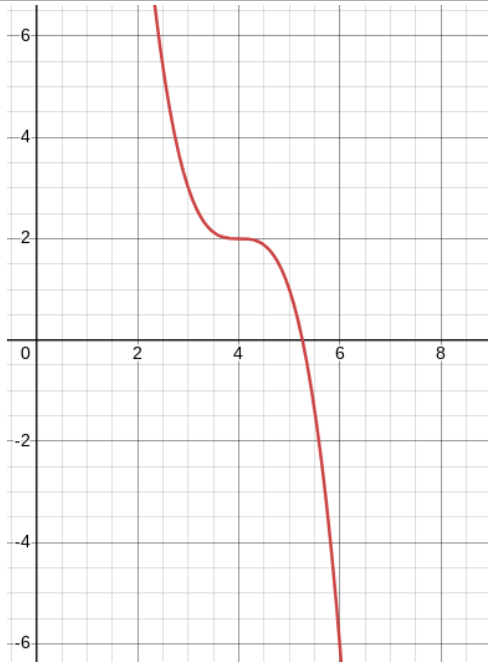| $y = 2x^3$	$y = (x - 2)^3$	$y = x^3 + 2$

Additional Examples

$y = -1.5(x + 1)^2 - 1$	$y = -(x - 4)^3 + 2$	$y = (x - 1)^4 + 3$