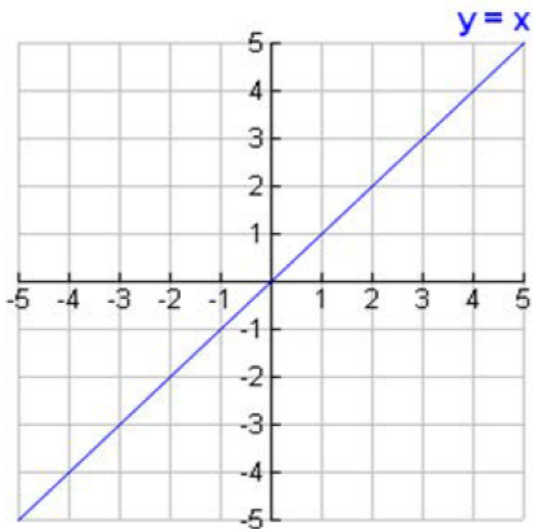


# Polynomial Functions

## Linear Function: $f(x) = x$



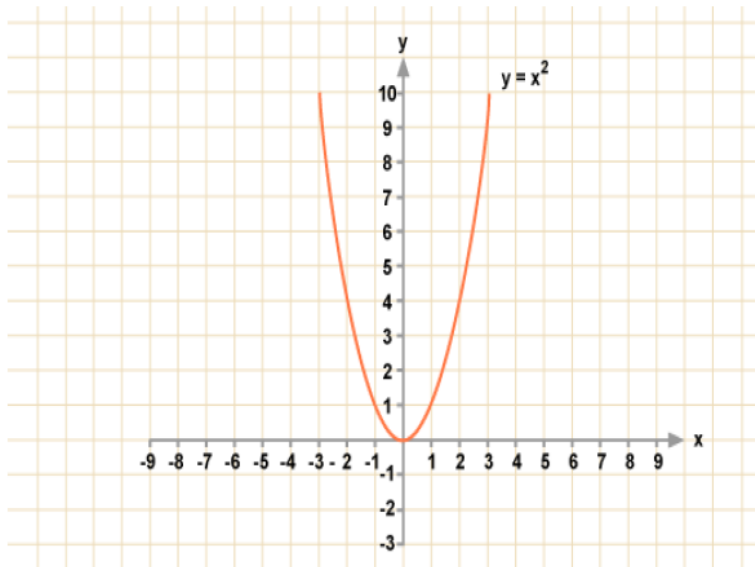
**Domain:** All real numbers

**Range:** All real numbers

**X – Intercept:** (0, 0)

**Y – Intercept:** (0, 0)

## Quadratic Function: $f(x) = x^2$



**Domain:** All real numbers

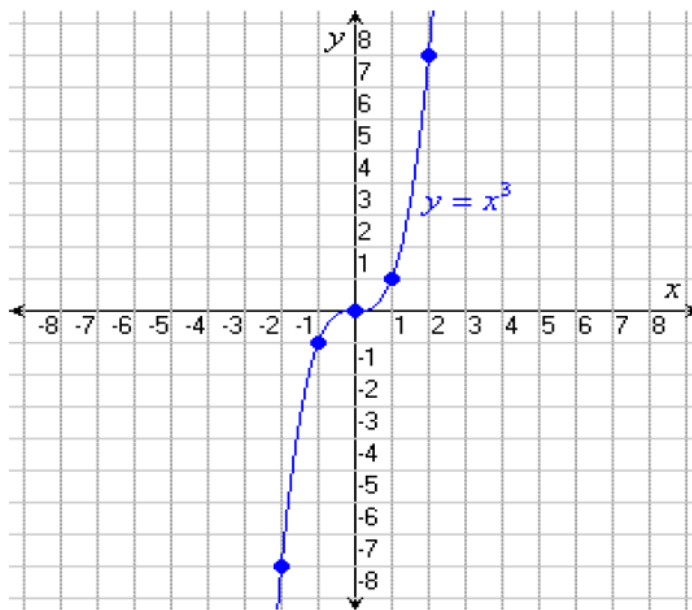
**Range:**  $y \geq 0$

**X – Intercept:** (0, 0)

**Y – Intercept:** (0, 0)

# Polynomial Functions

Cubic Function:  $f(x) = x^3$



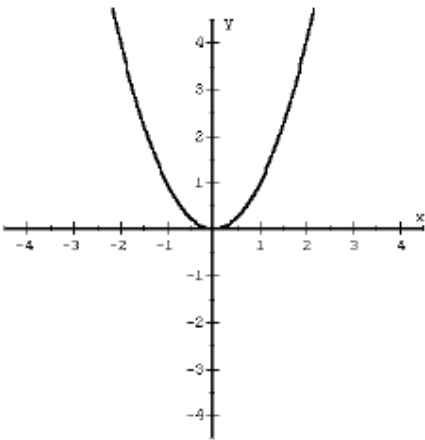
**Domain:** All real numbers

**Range:** All real numbers

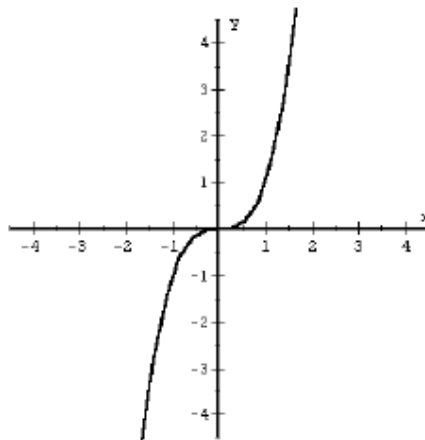
**X – Intercept:** (0, 0)

**Y – Intercept:** (0, 0)

# Polynomial Functions

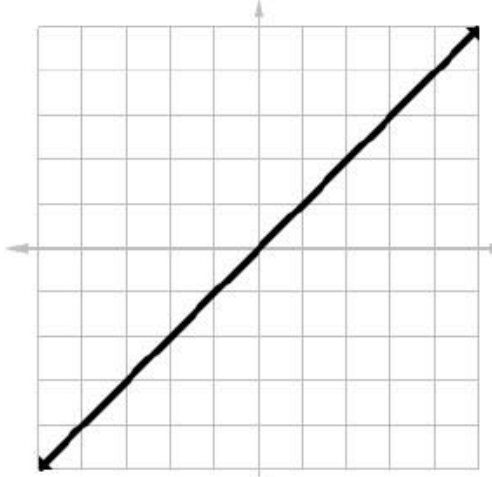
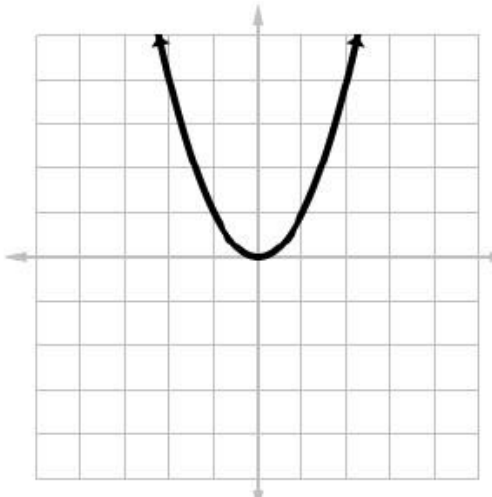
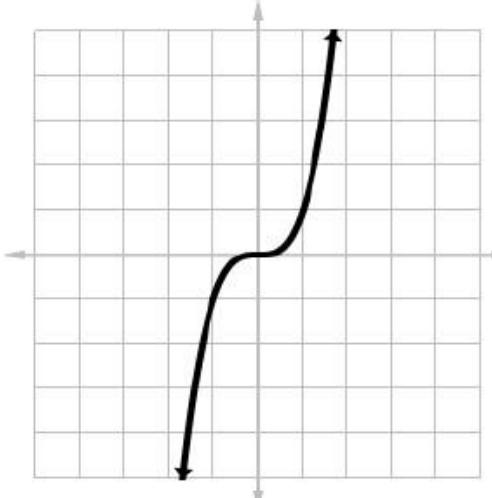


$f(x) = x^2$   
**Quadratic**



$f(x) = x^3$   
**Cubic**

# Polynomial Functions

Parent Function	Graph
<p><b><math>y=x</math></b>  <b>Linear, Odd</b>  <b>Domain:</b> <math>(-\infty, \infty)</math>  <b>Range:</b> <math>(-\infty, \infty)</math>  <b>End Behavior:</b>  <math>x \rightarrow -\infty, y \rightarrow -\infty</math>  <math>x \rightarrow \infty, y \rightarrow \infty</math>  <b>Critical points:</b>  <math>(-1, -1), (0, 0), (1, 1)</math></p>	
<p><b><math>y=x^2</math> Quadratic,</b>  <b>Even</b>  <b>Domain:</b> <math>(-\infty, \infty)</math>  <b>Range:</b> <math>[0, \infty)</math> <b>End Behavior:</b>  <math>x \rightarrow -\infty, y \rightarrow \infty</math>  <math>x \rightarrow \infty, y \rightarrow \infty</math>  <b>Critical points:</b>  <math>(-1, 1), (0, 0), (1, 1)</math></p>	
<p><b><math>y=x^3</math></b>  <b>Cubic, Odd</b>  <b>Domain:</b> <math>(-\infty, \infty)</math>  <b>Range:</b> <math>(-\infty, \infty)</math>  <b>End Behavior:</b>  <math>x \rightarrow -\infty, y \rightarrow -\infty</math>  <math>x \rightarrow \infty, y \rightarrow \infty</math>  <b>Critical points:</b>  <math>(-1, -1), (0, 0), (1, 1)</math></p>	

# Polynomial Functions

Parent Function	Graph	Parent Function	Graph
<p><b><math>y = x</math></b>  <b>Linear, Odd</b>                      Domain: <math>(-\infty, \infty)</math>                      Range: <math>(-\infty, \infty)</math>                      End Behavior:  <math>x \rightarrow -\infty, y \rightarrow -\infty</math>  <math>x \rightarrow \infty, y \rightarrow \infty</math></p>		<p><b><math>y = C</math></b>                      (<math>y = 2</math> in the graph)  <b>Constant, Even</b>                      Domain: <math>(-\infty, \infty)</math>                      Range: <math>\{y = C\}</math>                      End Behavior:  <math>x \rightarrow -\infty, y \rightarrow C</math>  <math>x \rightarrow \infty, y \rightarrow C</math></p>	
<p><b><math>y = x^2</math></b>  <b>Quadratic, Even</b>                      Domain: <math>(-\infty, \infty)</math>                      Range: <math>[0, \infty)</math>                      End Behavior:  <math>x \rightarrow -\infty, y \rightarrow \infty</math>  <math>x \rightarrow \infty, y \rightarrow \infty</math></p>		<p><b><math>y = x^3</math></b>  <b>Cubic, Odd</b>                      Domain: <math>(-\infty, \infty)</math>                      Range: <math>(-\infty, \infty)</math>                      End Behavior:  <math>x \rightarrow -\infty, y \rightarrow -\infty</math>  <math>x \rightarrow \infty, y \rightarrow \infty</math></p>	