Parent Graphs

Analyzing Functions!

domain:

range:

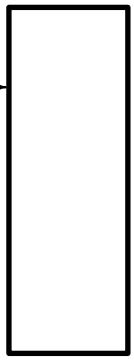
increasing:

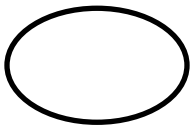
decreasing:

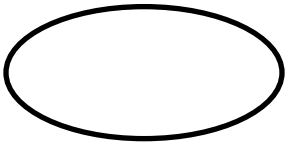
constant:

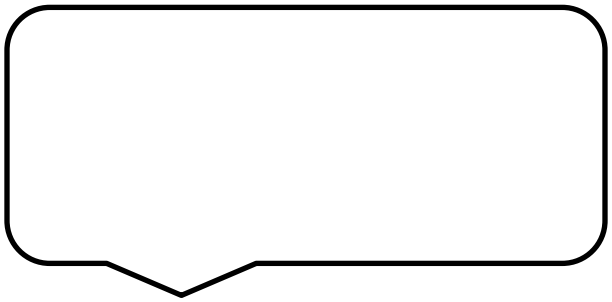
positive:

negative:









maximums/minimums:

x-intercepts:

y-intercepts:

symmetry:

end behavior:

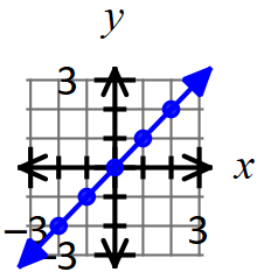
asymptotes:

continuity:

Identity Function (linear)

$f(x)=x$

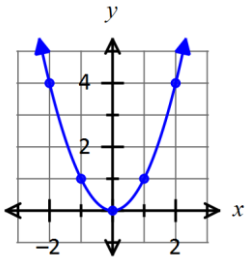
- Domain: $(-\infty,\infty)$
- Range: $(-\infty,\infty)$
- Line with slope of $m=1$
- Key Points: $(-2,-2),\ (-1,-1),\ (0,0),\ (1,1),\ (2,2)$



Square Function or Quadratic Function

$f(x)=x^2$

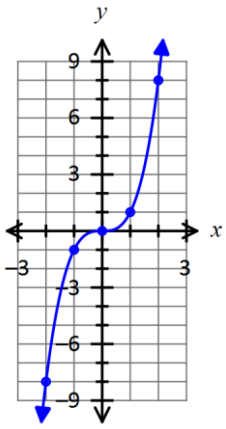
- Domain: $(-\infty,\infty)$
- Range: $[0,\infty)$
- Parabola
- Key Points: $(-2,4),\ (-1,1),\ (0,0),\ (1,1),\ (2,4)$



Cubic Function

$f(x)=x^3$

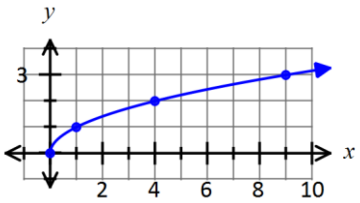
- Domain: $(-\infty,\infty)$
- Range: $(-\infty,\infty)$
- Key Points: $(-2,-8),\ (-1,-1),\ (0,0),\ (1,1),\ (2,8)$



Square Root Function

$f(x)=\sqrt{x}$

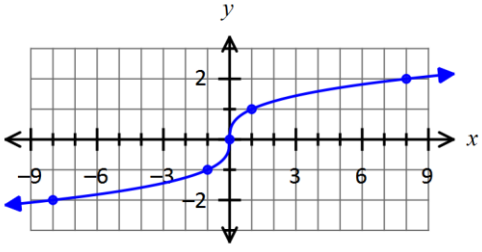
- Domain: $[0,\infty)$
- Range: $[0,\infty)$
- Endpoint: $(0,0)$
- Key Points: $(0,0),\ (1,1),\ (4,2),\ (9,3)$



Cube Root Function

$f(x)=\sqrt[3]{x}$

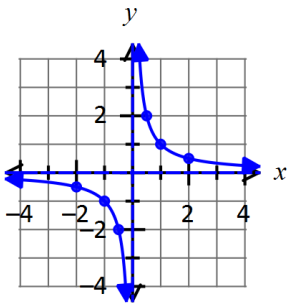
- Domain: $(-\infty,\infty)$
- Range: $(-\infty,\infty)$
- Key Points: $(-8,-2),\ (-1,-1),\ (0,0),\ (1,1),\ (8,2)$



Reciprocal Function

$f(x) = 1/x$

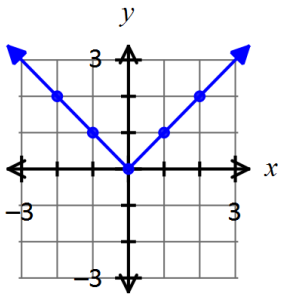
- Domain: $(-\infty, 0) \cup (0, \infty)$
- Range: $(-\infty, 0) \cup (0, \infty)$
- Hyperbola
- The *x*-axis and the *y*-axis are both asymptotes
- No Intercepts
- Key Points: $(-2, -\frac{1}{2})$, $(-1, -1)$, $(-\frac{1}{2}, -2)$, $(\frac{1}{2}, 2)$, $(1,1)$, $(2, \frac{1}{2})$



Absolute Value Function

$f(x) = |x|$

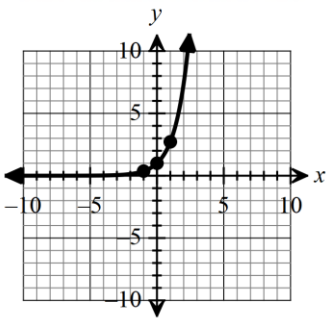
- Domain: $(-\infty, \infty)$
- Range: $[0, \infty)$
- Key Points: $(-2, 2)$, $(-1, 1)$, $(0, 0)$, $(1, 1)$, $(2, 2)$



Exponential Function

$f(x) = e^x$

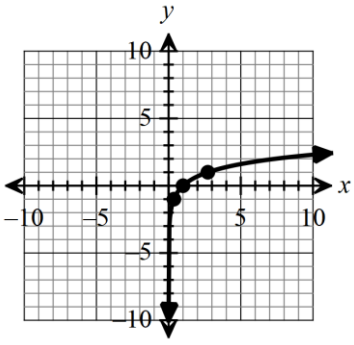
- Domain: $(-\infty, \infty)$
- Range: $(0, \infty)$
- Key Points: $\left(-1, \frac{1}{a}\right)$, $(0,1)$, $(1, a)$ where a is the base
- Asymptote: $y = 0$



Natural Logarithm Function

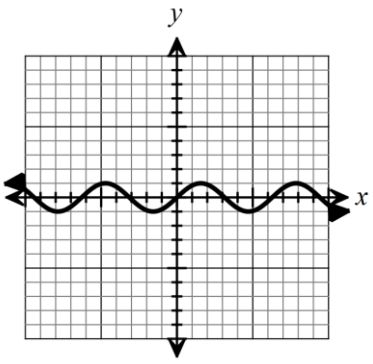
$f(x) = \ln x$

- Domain: $(0, \infty)$
- Range: $(-\infty, \infty)$
- Key Points: $\left(\frac{1}{a}, -1\right)$, $(1, 0)$, $(a, 1)$ where a is the base
- Asymptote: $x = 0$



Sine Function

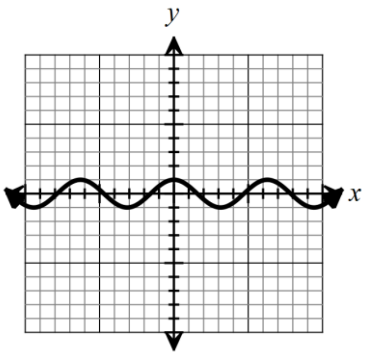
$f(x) = \sin x$



- Domain: $(-\infty, \infty)$
- Range: $[-1,1]$
- Key Points: $(0,0)$, $\left(\frac{\pi}{2},1\right)$, $(\pi,0)$, $\left(\frac{3\pi}{2},-1\right)$, $(2\pi,0)$

Cosine function

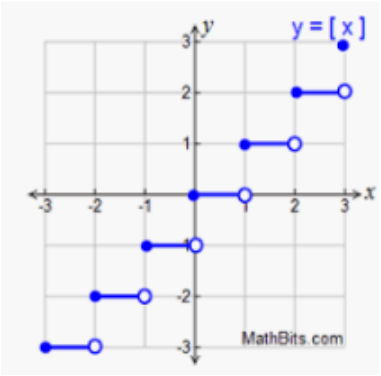
$f(x) = \cos x$



- Domain: $(-\infty, \infty)$
- Range: $[-1,1]$
- Key Points: $(0,1)$, $\left(\frac{\pi}{2},0\right)$, $(\pi,-1)$, $\left(\frac{3\pi}{2},0\right)$, $(2\pi,1)$

Greatest Integer Function

$f(x) = \text{int } x$ = Greatest integer less than or equal to x



Some books use f(x) = [x] instead of int(x)

- Domain: $(-\infty, \infty)$
- Range: the set of integers
- y-intercept = 0

This is also called a step function