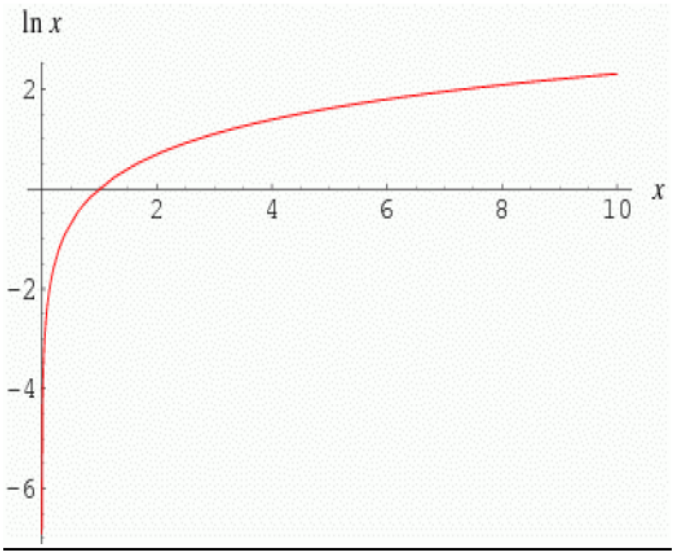
Logarithmic Functions

Natural Logarithmic Function: f(x) = lnx



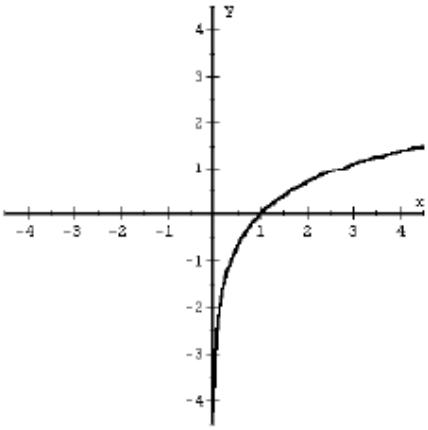
Domain: x > 0

Range: All real numbers

X-Intercept: (1, 0)

Y-Intercept: Does not exist

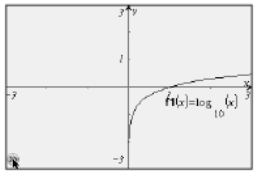
Vertical asymptote at x = 0

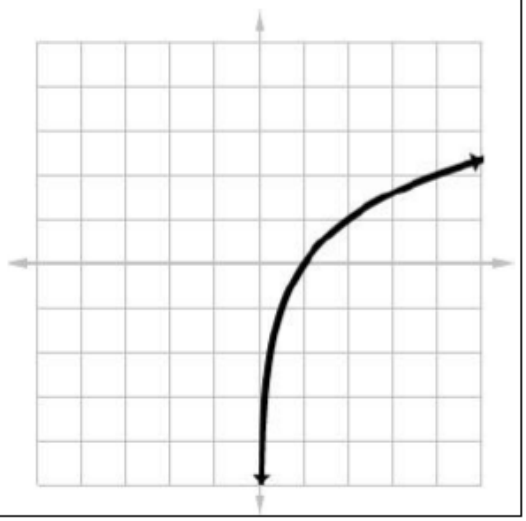


$f(x) = \log_a x$

Logarithmic

Logarithmic Functions

Name of Parent Function	Graph of Function	Table of Values	Equation of Parent Function	Special Features or Characteristics
Logarithmic Function		x | y -2 | err -1 | err 0 | undef 1 | 0 2 | 0.301 3 | 0.477	$f(x) = \log x$	• Crosses the *x*-axis at (1,0) • Domain is all Real Numbers >0 • Range is all Real Numbers ≥0

$\mathbf{y = \log_b x,\ b > 1}$ $(y = \log_2 x)$ **Log**, Neither Domain: $(0,\infty)$ Range: $(-\infty,\infty)$ End Behavior: $x \to 0^+,\ y \to -\infty$ x $\to \infty,\ y \to \infty$ Critical points: $(\frac{1}{b}, -1), (1,0), (b,1)$ Asymptote: $x = 0$	

Logarithmic Functions

Parent Function	Graph
$y = \log_b(x),\ b > 1$ **Log**, Neither Domain: $(0, \infty)$ Range: $(-\infty, \infty)$ End Behavior: $x \to 0^+,\ y \to -\infty$ $x \to \infty,\ y \to \infty$