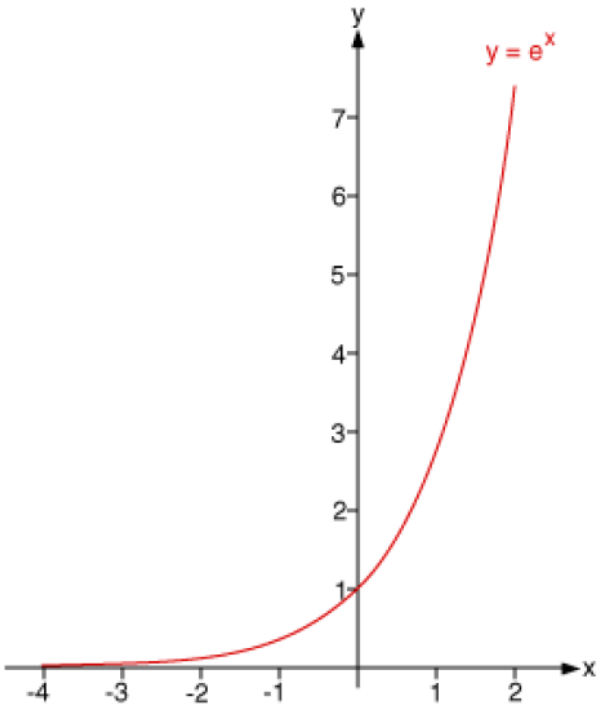
Exponential Functions

Natural Exponential Function: $f(x) = e^x$



Domain: All real numbers

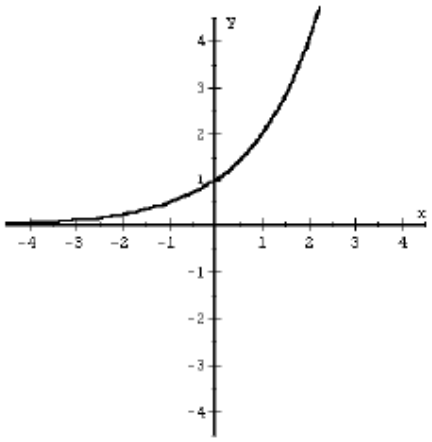
Range: $y > 0$

X-Intercept: Does not exist

Y-Intercept: (0, 1)

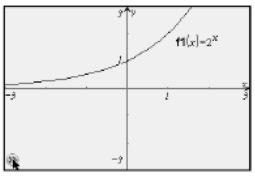
Horizontal asymptote at $y = 0$

Exponential Functions

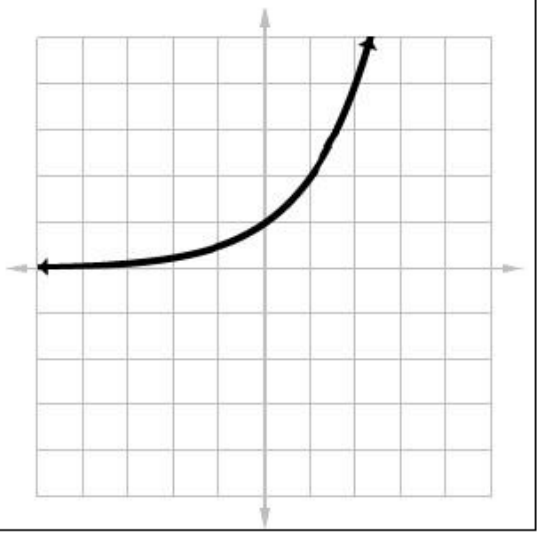


$$f(x) = a^x$$

Exponential

Name of Parent Function	Graph of Function	Table of Values	Equation of Parent Function	Special Features or Characteristics
Exponential Function		x | y -2 | 0.25 -1 | 0.5 0 | 1 1 | 2 2 | 4 3 | 8	$f(x) = 2^x$	• Crosses the *y*-axis at (0,1) • Domain is all Real Numbers • Range is all Real Numbers >0

Exponential Functions

$y = b^x$, $b > 1$ $(y = 2^x)$ **Exponential**, Neither Domain: $(-\infty,\infty)$ Range: $(0,\infty)$ End Behavior: $x \to -\infty$, $y \to 0$ $x \to \infty$, $y \to \infty$ Critical points: $(-1, \frac{1}{b})$, $(0,1)$, $(1,b)$ Asymptote: $y = 0$	

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