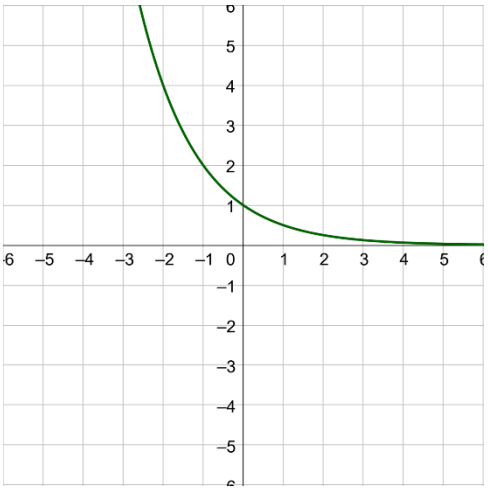
Precalculus

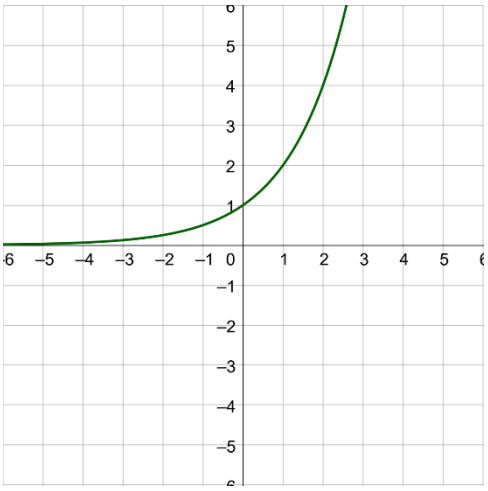
3-01 Exponential Functions

Exponential function

$$y = a \cdot b^x$$

- a is _____ amount (y-int)
- b is _____
- x is _____
- If $b > 1$
  - Exponential _____
- If $0 < b < 1$
  - Exponential _____
- Domain: _____
- Range: _____
- Horizontal Asymptote: _____
- y-intercept: _____





Transformations

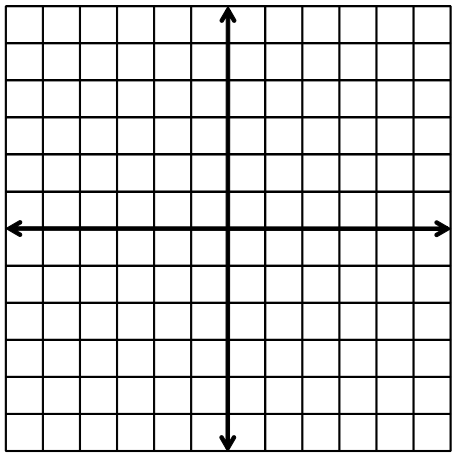
$$y = a \cdot b^{x-h} + k$$

- a _____ stretch
  - If a is negative, then _____ over x-axis
- h moves _____
- k moves _____

- Domain: _____
- Range:
  - _____ if $a > 0$
  - _____ if $a < 0$
- Horizontal Asymptote: _____
- y-int: _____ if $h = 0$

Graph by making a table

Graph $y = 4^{-x} + 3$



Exponential functions are _____

Each *x* gives a _____ *y*

Solve $16 = 2^{x+2}$

Solve $\left(\frac{1}{3}\right)^{x} = 81$

Natural Base

- $e = \left(1 + \frac{1}{n}\right)^{n}$ when $n \to \infty$
- $e \approx$ _____ ...

Compound Interest

$$A = P\left(1 + \frac{r}{n}\right)^{nt}$$

A = current amount
P = principle (initial amount)
r = yearly interest rate (APR)
n = number of compoundings per year
t = years

Compounded Continuously

$$A = Pe^{rt}$$