

{ 11-3 The Number "e"

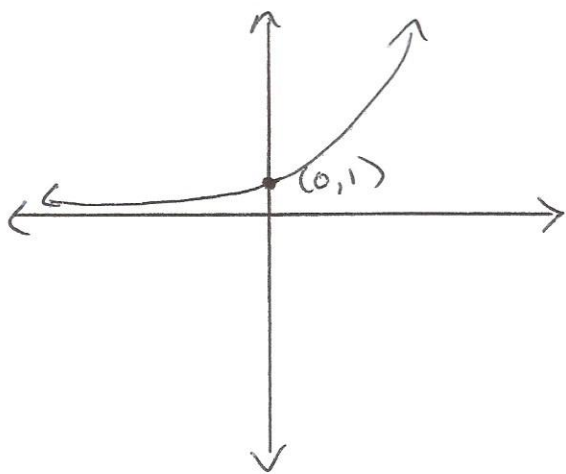
Def of "e": an irrational number derived from the sum of an infinite series

$$e = 1 + \frac{1}{1} + \frac{1}{1 \cdot 2} + \frac{1}{1 \cdot 2 \cdot 3} + \frac{1}{1 \cdot 2 \cdot 3 \cdot 4} + \dots$$

$$e \approx 2.718$$

* since $e > 1$, $y = e^x$ is a growth function

* Graphing: $y = e^x$ is similar to $y = 2^x$



• starts at $(0, 1)$

D: \mathbb{R}

R: $(0, \infty)$

A: $y = 0$

y: $(0, 1)$

b: increasing

* same transformations occur for $y = e^x$ as $y = 2^x$

* $y = e^{-x}$ means $y = \left(\frac{1}{e}\right)^x$

Notes continued...

Continuously Compound Interest

$$A = P e^{rt}$$

$t \Rightarrow$ time

$r \Rightarrow$ rate



Principal
initial investment

- use this formula if continuous

ex: invest \$10,000 at 5.5%
compounded continuously for 4 years.

$$A = 10,000 e^{(.055 \times 4)}$$

* calc

$$A = \$12,460.77$$

there is an "e"
key on Calc