

Honors Algebra II

Notes Section 4.3

Use Functions Involving e

VOCABULARY

Natural Base e : _____

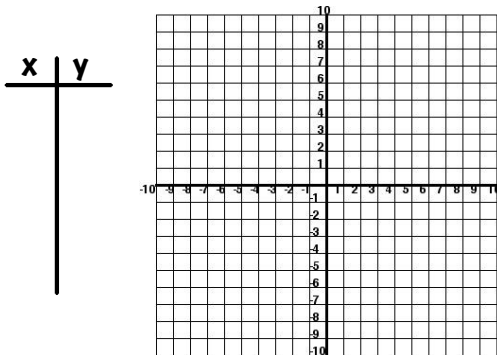
Natural Base Functions

$$y = ae^{rx}$$

I. Exponential Growth

$$a > 0 \text{ and } r > 0$$

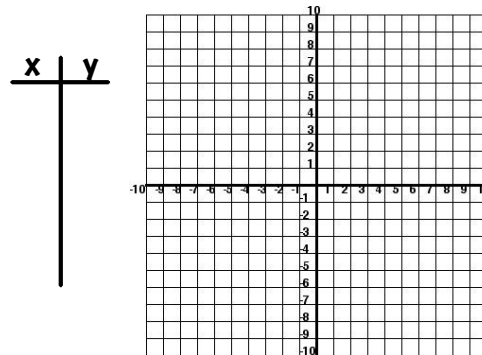
$$y = e^x$$



II. Exponential Decay

$$a > 0 \text{ and } r < 0$$

$$y = e^{-x}$$



EXAMPLE 1 Simplify the expression.

a) $e^2 \cdot e^5$ _____

b) $\frac{12e^4}{3e^3}$ _____

c) $(5e^{-3x})^2$ _____

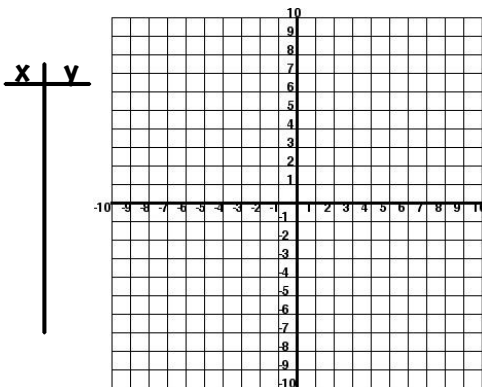
EXAMPLE 2 Use a calculator to evaluate.

a) e^4 _____

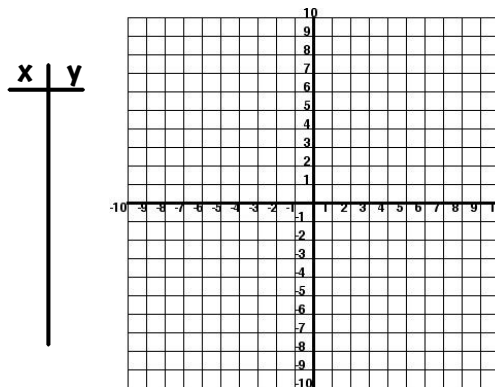
b) $e^{-0.09}$ _____

EXAMPLE 3 Graph the function. State the domain and range.

a) $y = 3e^{0.25x}$



b) $y = e^{-0.75(x-2)} + 1$



Domain: _____

Range: _____

Domain: _____

Range: _____

EXAMPLE 4 The length l (in centimeters) of a tiger shark can be modeled by the function $l = 337 - 276e^{-0.178t}$

where t is the shark's age (in years).

a) Graph using a graphing calculator.

b) Use the graph to estimate the length of a tiger shark that is 3 years old.

Continuous Compound Interest: $A = Pe^{rt}$

EXAMPLE 5 You deposit \$4000 in an account that pays 6% annual interest compounded continuously. What is the balance after 1 year?