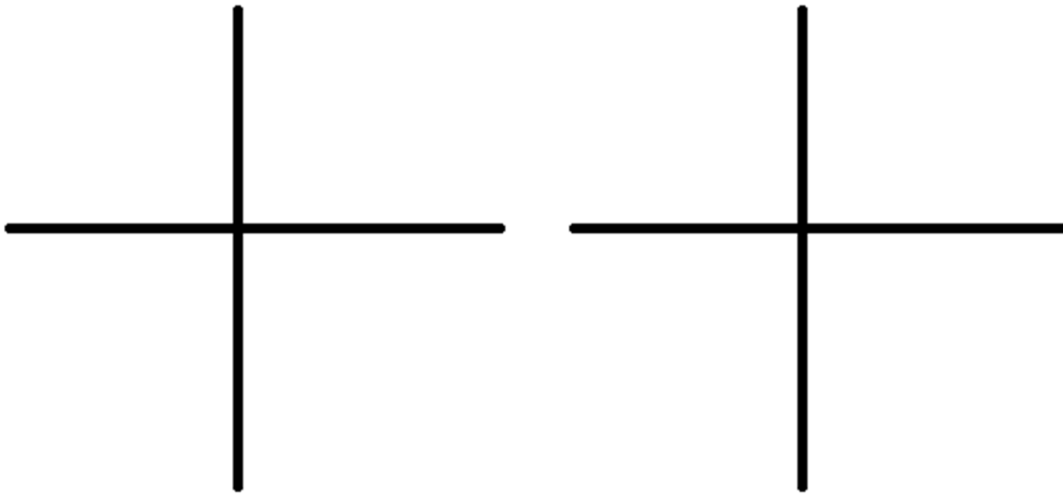


Section 1.6: Exponential Models

An exponential model is written in standard form:

Part I: The graphs of exponential models are as follows:



Part II: A special constant in exponential models:

“e”

Part III: Evaluation of Exponents on Calculators

Use a calculator to evaluate each.

$$2^5$$

$$\left(\frac{1}{2}\right)^4$$

$$e^4$$

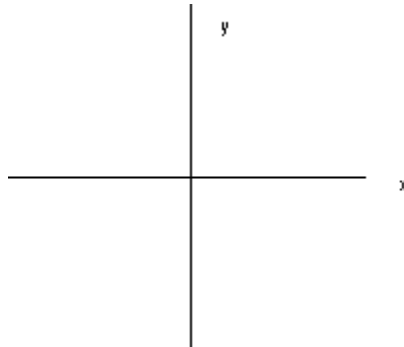
$$(e)^{\frac{1}{3}}$$

$$2e^{\frac{-1}{2}}$$

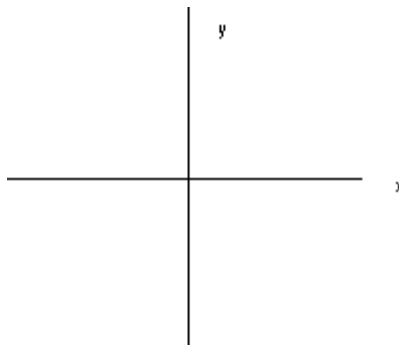
Part IV: Graphing of exponential models.

Sketch the graph of the exponential models below.

1. $y = 3^x$



2. $y = \left(\frac{1}{3}\right)^x$



Part V: Exponential Model Examples (Applications)

1. You have a summer job with 2 payment options.

Option #1: 6 week job, 5 days a week for \$3000 for the summer job.

Option #2:

2. Coffee cools in degrees Fahrenheit following the model: $T = 70 + 90e^{-0.045t}$ where t is the number of minutes the coffee has been sitting at room temperature and T is the temperature of the coffee.

What is the temperature of the coffee after 2 minutes sitting at room temperature?

What is the temperature of the coffee after 20 minutes sitting at room temperature?

3. In 1970, the population of the United States was 205,000,000. What was the predicted population of the United States in 1991 using the model $P = P_0 e^{kt}$ given the k value for the United States of 0.89%? HINT: Don't forget to convert 0.89% into a decimal before entering it into the model.