

MODULE 5.1 - EXPONENTIAL FUNCTIONS

LEARNING OBJECTIVES

In this section, you will:

- Evaluate exponential functions.
- Find the equation of an exponential function.
- Use compound interest formulas.
- Evaluate exponential functions with base e .

IDENTIFYING EXPONENTIAL FUNCTIONS

- State the definition of an exponential function.

EVALUATING EXPONENTIAL FUNCTIONS

- State the definition of exponential growth.

How To... Given two data points, write an exponential model.



APPLYING THE COMPOUND INTEREST FORMULUA

- State the definition of the compound interest formula.

INVESTINGATING CONTINUOUS GROWTH

- State the definition of the continuous growth/decay formula.

How To... Given the initial value, rate of growth or decay, and time t , solve a continuous growth or decay function.



MODULE 5.1 - CLASS EXAMPLES

1. $9^{\frac{1}{2}}$

2. $2^{\frac{3}{2}}$

3. $\sqrt[6]{x^4}$

4. Identify which of the following represents an exponential function and which represents a linear function.
- After a membership cost of \$10, the cost to purchase any audio book from a certain company is \$2.99.
 - A population of bacteria increases by a fraction of $\frac{1}{8}$ every 24 hours.

The population of India since 2013, can be represented by the following, $P(t) = 1.25(1.012)^t$, where t is the number of years since 2013.

5. Is this exponential growth or decay? What does that mean in the application?
6. What is the growth rate? What does that mean in the application?
7. If $P(t)$ is in millions, what is the initial population?
8. Given $f(x) = 1.2e^{2x} - 0.3$ evaluate $f(3)$.

9. Find the formula for an exponential function that passes through the two points given.
(0,2000) and (2,20)

10. Find the formula for an exponential function that passes through the two points given.
(3,1) and (5,4)

11. A car was valued at \$38,000 in the year 2007. By 2013, the value had depreciated to \$11,000. If the car's value continues to drop by the same percentage, what will it be worth by 2017?