

LESSON 6: APPLICATIONS OF EXPONENTIAL FUNCTIONS

Objectives: 1. To apply the exponential function to the laws of natural growth and decay
2. To apply the exponential function to determine continuous

Natural Growth and Decay

$$y = y_0 \cdot e^{kt}$$

e xponential

Continuous Interest

$$a = Pe^{rt}$$

Examples

1. Suppose a savings account pays 8% interest. If \$500 is deposited in this account, find the amount of money in the account at the end of two years if the interest is compounded
 - a. annually
 - b. quarterly
 - c. monthly
 - d. daily
 - e. continuously

2. Polonium-210 has a half-life of 150 days.
 - a. If a sample has a mass of 400 mg, find a formula for the mass that remains after t days.
 - b. Find the mass after 110 days.
 - c. When will the mass be reduced to 50 mg?

Problems

1. The world population in 1960 was 3 billion people. In 1970 the world population had increased to 3.6 billion people. At this rate how long will it take the population to double (6 billion people)?