Section 3-6: Examples

Example: The dollar value $v(t)$ of a car that is t years old is given by the following exponential model.

$$v(t) = 29,200(0.88)^t$$

(a) What is the initial value of the car?

(b) By what percent does the value of the car change each year?

(c) What is the value of the car after 3 years?

(d) How long will it take for the car to be worth half of its original value? Round your answer to two decimal places.

Example: The total number of cases of a disease reported during an outbreak t weeks after March 1st is given by the following exponential model.

$$C(t) = 200(2.634)^t$$

(a) What is the initial number of reported cases?

(b) By what percent does the total number of reported cases change each week?

(c) What is the total number of reported cases after 4 weeks?

(d) How long will it take for the total number of reported cases to grow to 100 times the original value? Round your answer to two decimal places.

Example: If \$7200 is invested at a rate of 8.0% compounded continuously, the amount of the investment is given by the following exponential model.

$$A(t) = 7200e^{0.08t}$$

(a) What is the amount of the investment after 20 years?

(b) How long will it take the investment to reach \$10,000? Round your answer to two decimal places.

(c) How long will it take the investment to double? Round your answer to two decimal places.

Example: A cup of tea that is 150° is placed on a table in a room whose temperature is 70°. The temperature of the cut of tea after t minutes is given by the following exponential model.

$$T(t) = 80e^{-0.094t} + 70$$

(a) What is the temperature of the cup of tea after 5 minutes?

(b) How long will it take the cup of tea to reach a temperature of 100°?