

Name: \_\_\_\_\_ Hour: \_\_\_\_\_ Date: \_\_\_\_\_

## NOTES: Section 8.7 – Exponential Decay Functions

Goals: #1 - I can write and graph exponential decay functions.



*Homework: Section 8.7 Worksheet*

### Warm Up:

1. A family purchased a condo for \$80,000. Each year the value of the condo increases by 5%.

a. Write a model that represents the value of the condo over time.

b. Find the value of the condo after 6 years.

2. An initial population of 1000 starfish doubles each year for 4 years.

a. Write a model that represents the population of the starfish over time.

b. What is the starfish population after 4 years?

**Exploration #1:** Tell whether the model is an exponential growth or exponential decay.

1.  $y = 17(1.09)^t$

2.  $y = 5500(0.8)^t$

3.  $y = 80,000(2)^t$

What is the growth/decay rate (%) for each?

Name: \_\_\_\_\_ Hour: \_\_\_\_\_ Date: \_\_\_\_\_

**Notes:**

Another use of \_\_\_\_\_ is to model \_\_\_\_\_.

A quantity is decreasing \_\_\_\_\_ if it decreases by the same \_\_\_\_\_ in each unit of \_\_\_\_\_.

\_\_\_\_\_ can be modeled by the equation:

$$y = C(1 - r)^t$$

**Example #1:** You bought a car for \$16,000. You expect the car to lose value, or depreciate, at a rate of 12% per year. Write an exponential decay model to represent this situation.

- a. Using the model, predict the value of the car after 7 years.

**Example #2:** In Lancaster, WI the population of 100,000 people decreases by 2% each year. Write a model to represent this situation.

- a. Using the model, predict how many people will live in Lancaster in 20 years.

Name: \_\_\_\_\_ Hour: \_\_\_\_\_ Date: \_\_\_\_\_

**You practice:**

1. A business earned \$85,000 in 2000. Then its earnings decreased by 2% each year for 10 years.

a. Write a model to represent this situation.

b. Using the model, predict how much the business will have earned in 5 years.

2. From 1894 to 1903, the number of miles of cable car track in the United States decreased by about 11% per year. There were 302 miles of track in 1894.

a. Write a model to represent this situation.

b. Using this model, predict how many miles of track there will be in 1900.

**Notes:**

• \_\_\_\_\_:

○ Model:

○ Key words:

• \_\_\_\_\_:

○ Model:

○ Key words:

