

Name: _____ Date: _____

Exponential Decay

Decay: $P(1 - \frac{r}{n})^{nt}$

1) Given the equation $y = 24(.70)^x$

a) What is the Decay Factor?

.70
.30 or 30%

b) What is the rate of decay?

24

c) What is the initial value?

2.88

d) Evaluate for $x = 6$

2) Given the equation $y = 8(.23)^x$

a) What is the Decay Factor?

.23

b) What is the rate of decay?

.77 or 77%

c) What is the initial value?

8

d) Evaluate for $x = 4$

.022

3) Given the equation $y = 104(.94)^x$

a) What is the Decay Factor?

.94

b) What is the rate of decay?

.06 or 6%

c) What is the initial value?

104

d) Evaluate for $x = 7$

67.44

4) The mice population is 25,000 in 2000 and is decreasing by 20% each year.

a) Write an exponential equation describing this situation.

$25000(1 - .20)^x$

b) How many mice will there be 3 years from now?

$25000(.80)^3$

12,800

5) In 2010 I bought a car for \$28,000. As soon as I drove it off the lot the value started depreciating at a rate of 10% per year.

a) Write an exponential equation describing this situation.

$28000(1 - .10)^x$

b) What will the car be worth in 2020? 10 yrs.

$28000(.90)^{10}$

\$9,763

Day 5: Applications of Exponentials

Name: _____

Practice Assignment

Directions: Label if the equation represents growth or decay. Then determine the growth/decay factor and growth/decay rate. Remember to write your rate as a percentage.

1) $y = 10(1.35)^x$ _____

Growth/Decay Factor: 1.35Growth/Decay Rate: .35 or 35%

How much am I over or under 1?

2) $y = 742(0.60)^x < 1$ _____

Growth/Decay Factor: 0.60Growth/Decay Rate: .40 or 40%

$1 - .60 = ?$

3) $y = (1.04)^x$ _____

Growth/Decay Factor: 1.04 ^{BASE}Growth/Decay Rate: .04 or 4%

4) $y = 7500(0.42)^x$ _____

Growth/Decay Factor: 0.42Growth/Decay Rate: .58 or 58%

$1 - .42 = ?$

5) $y = 50(1+.23)^x$ _____

Growth/Decay Factor: 1.23Growth/Decay Rate: .23 or 23%

6) $y = 1500(0.925)^x$ _____

Growth/Decay Factor: 0.925Growth/Decay Rate: .075 or 7.5%

$1 - .925 = ?$

Directions: Create an exponential growth/decay model and use it to solve each problem.

7) A new SUV depreciates at a rate of 23% per year. If the original selling price was \$30,000, how much will the vehicle be worth after 4 years?

Model: $30000(1 - .23)^t$

$30000(1 - .23)^4$

\$ 10,545.91