

Exponential Growth and Decay Classwork

Name: _____ Date: _____

$$\textit{Growth: } y = P(1+r)^t$$

$$\textit{Decay: } y = P(1-r)^t$$

- 1) Given the equation $y = 35(0.57)^x$
- a) Does this equation represent growth or decay? _____
 - b) What is the rate of growth or decay? _____
 - c) What is the initial value? _____
 - d) Evaluate for $x = 5$ _____
- 2) Given the equation $y = 225(1.23)^x$
- a) Does this equation represent growth or decay? _____
 - b) What is the rate of growth or decay? _____
 - c) What is the initial value? _____
 - d) Evaluate for $x = 2$ _____
- 3) Given the equation $y = 154(1.06)^x$
- a) Does this equation represent growth or decay? _____
 - b) What is the rate of growth or decay? _____
 - c) What is the initial value? _____
 - d) Evaluate for $x = 7$ _____
- 4) Ryan is saving for his college tuition. He has \$2,550 in a savings account that pays 6.25% annual interest.
- a) Write an exponential equation describing this situation.

 - b) How much money will Ryan have in his account 6 years from now?
- 5) A used car was purchased for \$12,329 this year. Each year the car's value decreases 8.5%.
- a) Write an exponential equation describing this situation.

 - b) What will the car be worth in 2020?

6) Jeremiah owns a business. His first year he made \$11,212, each of the following years his profit increased 12%.

a) Write an exponential equation describing the situation.

b) What will he make in 20 years?

7) Dianna just bought a home. She paid \$240,000. She is able to pay 20% of the loan off each year.

a) Write an exponential equation describing the situation.

b) What will she owe in 10 years?

8) A radioactive material decays at a rate of 40% per hour.

a) If we start with 80 grams of the substance, can you find a formula that models this rate of decay?

c) How much will be remaining at the end of 6 hours?

d) About how many hours does it take to decay to less than a gram?

9) You buy a commemorative coin for \$110. Each year the value increases by 4%.

a) Write a model for this situation.

b) Find the value of the coin after 6 years.

c) How long will it take for the coin to double in value?

10) You just won the lotto. You have two options, you can take the full \$10,000,000 now or they will pay you 1,000 dollars this year and then double the amount they pay you every year for 10 years. Which way will get you more money?