Name: _____

Period:

Growth	**Decay**
$y = a(1 + r)^x$	$y = a(1 - r)^x$

a = the initial **amount** before measuring growth/decay
r = the growth/decay **rate**, which is referred to as a percent
x = the number of **time** intervals that have elapsed

1) 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.

2) 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?

3) 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 = 3.

For each word problem that follows, write the exponential equation to model the situation.

4) A zombie infection in Morton East High School grows by 15% per hour. The initial group of zombies was a group of 4 freshmen. How many zombies are there after 6 hours?

5) Juan is saving for his college tuition. He has $2,550 in a savings account that pays 6.25% annual interest.

6) Cars depreciate in value over time. A used car was purchased for $15,500 this year. Each year the car's value decreases 7.5%.

7) Ned owns a side business detailing cars. His first year he made $12,500 and each of the following years his profit increased 8.25%.

8) There are 64 teams entered in a basketball tournament. Half of the teams are eliminated each round. How many teams are left after 4 rounds?

9) Bacteria in a dirty glass triple every hour. If there are 75 bacteria to start, how many are in the glass after 1 day?

10) The population of a city of 150,000 people is devastated by an unknown virus that kills 30% of the population per day. How many people are left after a week?

11) There are 1,250,000 acres of forest in northwestern Colorado. One-quarter percent of the forest is destroyed by pollution every year. How many acres are left after 50 years?

12) A new IPod is estimated to lose 20% of its value every six months after purchase. How much is the value of an IPod that costs $199 after someone has owned it for 2 years?

13) A recent college graduate accepts a job at MATHguide.com. The job has a salary of $52,000 and is guaranteed an annual pay increase of 2.5%.

14) A pawn shop is trying to sell a big screen TV. The owner decides to set the price at $850 and decrease the price by 3.5% after every week it doesn't sell.