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

**Exponential Growth, Decay and Interest Models**

***Growth: Decay: Compound Interest:***

***Continuously Compounded Interest:***

1) Charity put $4,900 into a savings account that earned a fixed interest rate of 4.5% compounded monthly. How much will be in her account in 5 years?

2) Jake bought a car for $29,560 in 2008. The value of the car depreciates 7.2% each year. How much was the car worth in 2016 when he tried to sell it?

3) Monica was studying a bacteria culture in a lab. Initially there were 268 bacteria on the first day. The bacteria increased by 9.4% each day. How many bacteria were there 14 days later?

4) Zoe has $12,219 in a retirement fund that earns interest quarterly at a rate of 3.9%. How much will be in her retirement fund in 10 years’ time?

5) Louis has $5000 in a savings account that earns a 4% interest rate compounded continuously. How much money will be in his account in 6 years?

6) A farm that grew corn began to realize that they were losing one quarter of their crops each year due to a bug infestation. If they grew about 140,000 ears of corn this year, how many ears of corn can they expect to have 3 years from now.

7) Keri deposited $2100 in a savings account. Twenty years later the balance was $5180. What was the interest rate for the account?

8) The value of a car decreases by 12.5% each year since it was purchased. After 6 years the value is $9800. Find the original cost of the car.

9) Since January 1999, the population of the city of Jacksonite has grown according to the mathematical model , where *t* is the number of years since January 1999.

a) Explain what the numbers and 1.019 represent in this model.

b) What would the population be in 2020 if the growth continues at the same rate.

10) Charlie was given an inheritance of $12,500 and is trying to determine which bank has the better savings account. Bank A offers a fixed rate of 4.8% compounded monthly whereas Bank B offers a 3.1% interest rate compounded continuously.

a) Determine how much money would be in each bank in 10 years’ time.

b) Which is the better bank for Charlie? By how much?

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**KEY**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Exponential Growth, Decay and Interest Models**

***Growth: Decay: Compound Interest:***

***Continuously Compounded Interest:***

1) Charity put $4,900 into a savings account that earned a fixed interest rate of 4.5% compounded monthly. How much will be in her account in 5 years?

2) Jake bought a car for $29,560 in 2008. The value of the car depreciates 7.2% each year. How much was the car worth in 2016 when he tried to sell it?

3) Monica was studying a bacteria culture in a lab. Initially there were 268 bacteria on the first day. The bacteria increased by 9.4% each day. How many bacteria were there 14 days later?

4) Zoe has $12,219 in a retirement fund that earns interest quarterly at a rate of 3.9%. How much will be in her retirement fund in 10 years’ time?

5) Louis has $5000 in a savings account that earns a 4% interest rate compounded continuously. How much money will be in his account in 6 years?

6) A farm that grew corn began to realize that they were losing one quarter of their crops each year due to a bug infestation. If they grew about 140,000 ears of corn this year, how many ears of corn can they expect to have 3 years from now.

7) Keri deposited $2100 in a savings account. Twenty years later the balance was $5180. What was the interest rate for the account?

8) The value of a car decreases by 12.5% each year since it was purchased. After 6 years the value is $9800. Find the original cost of the car.

9) Since January 1999, the population of the city of Jacksonite has grown according to the mathematical model , where *t* is the number of years since January 1999.

a) Explain what the numbers and 1.019 represent in this model.

b) What would the population be in 2020 if the growth continues at the same rate.

10) Charlie was given an inheritance of $12,500 and is trying to determine which bank has the better savings account. Bank A offers a fixed rate of 4.8% compounded monthly whereas Bank B offers a 3.1% interest rate compounded continuously.

a) Determine how much money would be in each bank in 10 years’ time.

b) Which is the better bank for Charlie? By how much?

Bank A is better by