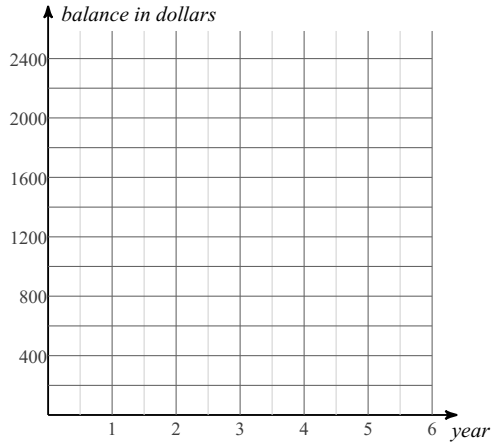
Continuous Exponential Growth and Decay

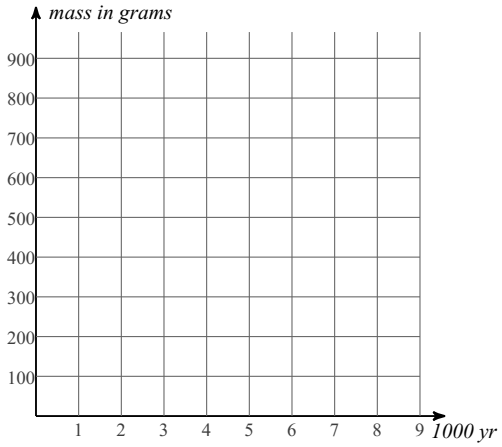
Date_____ Period____

Solve each continous exponential growth/decay problem. You may use the provided graph to plot points or sketch the exponential function.

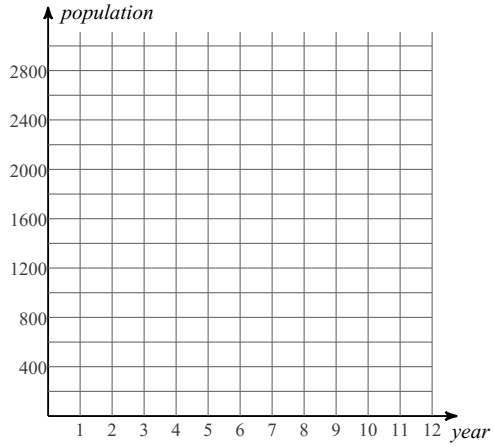
1) A savings account balance is compounded continuously. If the interest rate is 3% per year and the current balance is $1,854.00, what will the balance be 5 years from now?



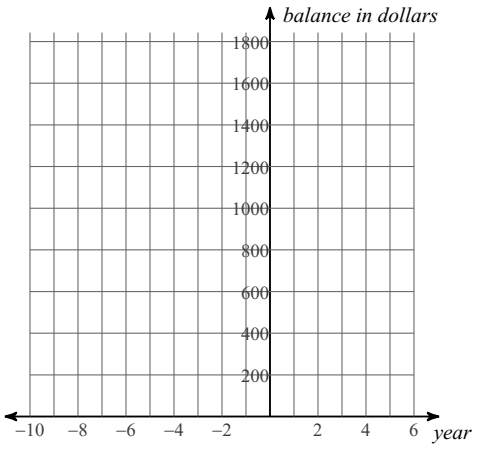
2) Radioactive isotope Berkelium-247 decays exponentially. If the continuous decay rate is 50% per thousand years and the current mass is 804.90 grams, what will the mass be 7 thousand years from now?



3) For a period of time, an island's population grows exponentially. If the population doubles every 17 years and the current population is 1,725, what will the population be 10 years from now?



4) A savings account balance is compounded continuously. If the balance was $1,183.63 8 years ago and the current balance is $1,389.00, what will the balance be 5 years from now?



Solve each continous exponential growth/decay problem.

5) For a period of time, E. coli bacteria in a culture grows exponentially. If the continuous growth rate is 1% per minute and the current population is 165.0 million, what will the population be 6 minutes from now?

6) Atmospheric pressure decreases approximately exponentially as elevation increases. If the continuous rate of decrease is determined to be 12% per kilometer and the pressure at sea level is 751.0 mmHg, what is the pressure at 8.3 kilometers above sea level?

7) A savings account balance is compounded continuously. If the balance doubles every 23 years and the current balance is $1,059.00, what will the balance be 6 years from now?

8) For a period of time, an island's population grows exponentially. If the population was 1,128 6 years ago and the current population is 1,351, what will the population be 7 years from now?

Candle Center - Infinite Algebra 2 Name_____

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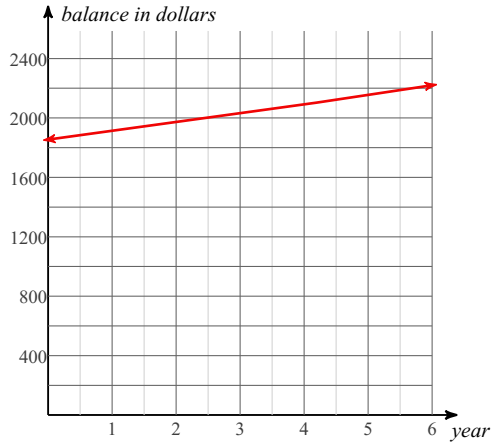
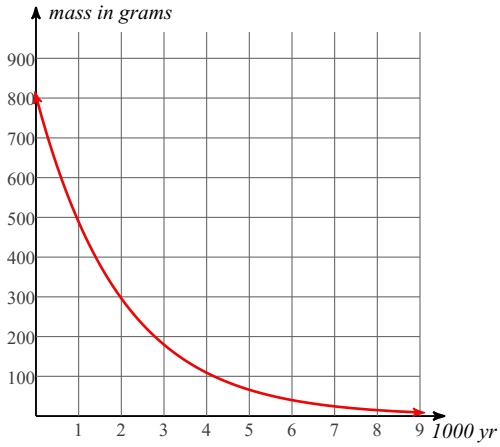


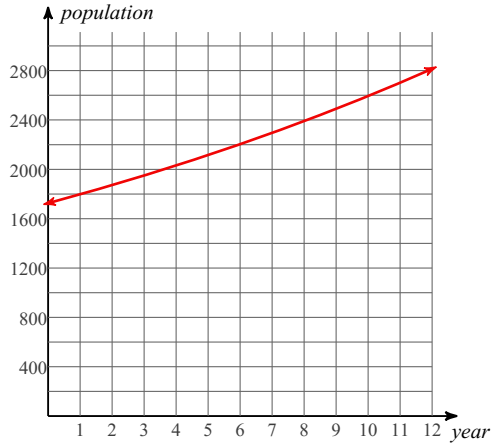
$1854e^{0.03 \cdot 5} \approx \$2{,}154.04$

2) Radioactive isotope Berkelium-247 decays exponentially. If the continuous decay rate is 50% per thousand years and the current mass is 804.90 grams, what will the mass be 7 thousand years from now?



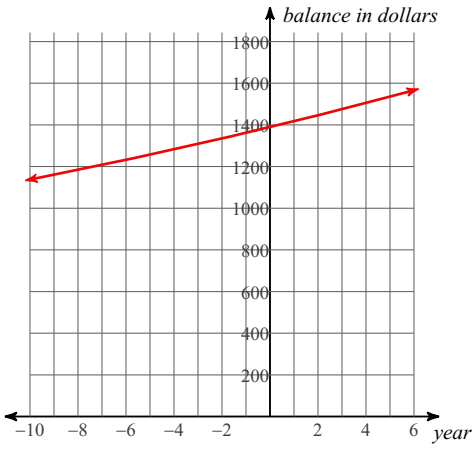
$804.9e^{-0.5 \cdot 7} \approx 24.31$ grams

3) For a period of time, an island's population grows exponentially. If the population doubles every 17 years and the current population is 1,725, what will the population be 10 years from now?



$1725 \cdot 2^{\frac{10}{17}} \approx 2{,}593$

4) A savings account balance is compounded continuously. If the balance was $1,183.63 8 years ago and the current balance is $1,389.00, what will the balance be 5 years from now?



$1389 \cdot \left(\frac{1389}{1183.63}\right)^{\frac{5}{8}} \approx \$1{,}535.08$

Solve each continous exponential growth/decay problem.

5) For a period of time, E. coli bacteria in a culture grows exponentially. If the continuous growth rate is 1% per minute and the current population is 165.0 million, what will the population be 6 minutes from now?

$165e^{0.01 \cdot 6} \approx 175.2 \text{ million}$

6) Atmospheric pressure decreases approximately exponentially as elevation increases. If the continuous rate of decrease is determined to be 12% per kilometer and the pressure at sea level is 751.0 mmHg, what is the pressure at 8.3 kilometers above sea level?

$751e^{-0.12 \cdot 8.3} \approx 277.4 \text{ mmHg}$

7) A savings account balance is compounded continuously. If the balance doubles every 23 years and the current balance is $1,059.00, what will the balance be 6 years from now?

$1059 \cdot 2^{\frac{6}{23}} \approx \$1{,}268.89$

8) For a period of time, an island's population grows exponentially. If the population was 1,128 6 years ago and the current population is 1,351, what will the population be 7 years from now?

$1351 \cdot \left(\frac{1351}{1128}\right)^{\frac{7}{6}} \approx 1{,}667$