Name:_____

Solve each growth or decay problem.

1. For a period of time, an island's population grows at a rate proportional to its population. If the growth rate is 3.8% per year and the current population is 1543, what will the population be 5.2 years from now?

2. During the exponential phase, E. coli bacteria in a culture increase in number at a rate proportional to the current population. If the growth rate is 1.9% per minute and the current population is 172.0 million, what will the population be 7.2 minutes from now?

3. Radioactive isotope Carbon-14 decays at a rate proportional to the amount present. If the decay rate is 12.10% per thousand years and the current mass is 135.2 mg, what will the mass be 2.2 thousand years from now?

4. You invest $1,000 at a rate of 3% compounded quarterly. What will your new balance be after 5 years?

5. You bought a Boston Whaler in 2004 for $12,500. The boat's value depreciates by 7% a year. How much is the boat worth in 2012? What will it be worth in 2020?

State whether the formula models growth or decay, explain how you know.

1. $y = 3^x$

2. $y = 5 \times (0.5)^x$

3. $y = 0.25^x$

4. $y = 6 \times (1.01)^x$

5. $y = 3 \times (0.033)^x$

6. $y = 5.125^x$