

PRECAL HONORS

Name _____

4.1 – EXPONENTIAL FUNCTIONS

For each of the following functions, [a] identify the parent function, and [b] describe a sequence of transformations that would change the graph of the parent into the given function.

1. $y = \frac{1}{4} \cdot 8^{x+1} - 2$

2. $y = e^{3x+6}$

3. $y = 1 - 3^{2-x}$

Sketch the graph of each of the following functions.

4. $y = (-2)\left(\frac{1}{2}\right)^x - 1$

5. $y = 3^{x+1} - 2$

6. $y = 4 - 2^x$

Solve each of the following word problems.

7. Mike invests \$5000 in an account that bears 4.1% APR compounded quarterly. What will the value of this investment be after ten years?

8. Sherri invests \$10,000 in an account that draws 2% APR compounded continuously. What will be the value of the investment after five years?

9. Carl invests \$20,000 in a retirement account that draws 3% APR compounded monthly. How long will it take for this investment to reach a value of \$50,000?

10. A certain culture of the bacterium *Streptococcus A* initially has 10 bacteria and is observed to double every 1.5 hours. Approximately how many bacteria will be present after 35 hours?

11. A certain culture of the bacterium *Rhodobacter sphaeroides* initially has 25 bacteria and is observed to double every 5 hours. How long will it take for the colony to reach a population of one million?

12. The population of a certain species of fish has a relative growth rate of 1.2% per year. It is estimated that the population in 2000 was 12 million. What was the approximate population of this species in the year 2005?

13. The half-life of a certain radioactive substance is 14 days. There are 6.6 g present initially. When will there be less than 1 g remaining?