

8. During the 1990s, the forested area in Guatemala decreased at an average rate of 1.7%. The forested area on Guatemala was about 34,400 square kilometers in 1990.
- Write an equation for the amount of forested area  $t$  years after 1990.
  - If the trend has continued as described above, use the equation to find the amount of forested area in 2010 and 2020.
9. Wilma and Walder's Weaving Wanders bought a piece of weaving equipment for \$60,000. It is expected to depreciate at an average rate of 10% per year.
- Write an equation representing the value of the equipment  $t$  years after its purchase.
  - Use the equation to find the value of the equipment 6 years after its purchase.
10. A biologist is studying a newly-discovered species of bacteria. He places 100 bacteria in a petri dish in order to study its behavior. The bacteria is estimated to be growing at a rate of 17% per hour.
- Write an equation for the amount of bacteria  $t$  hours after its placement in the petri dish.
  - Use the equation to find how much bacteria there will be after 12 hours?
11. The population of rabbits in a national forest has been declining by  $1/20$  each year since 2003 when its population was measure at 4,578 rabbits.
- Write an equation for the population  $t$  years after 2003.
  - Use the equation to predict the population of the rabbits in the forest in 2015.

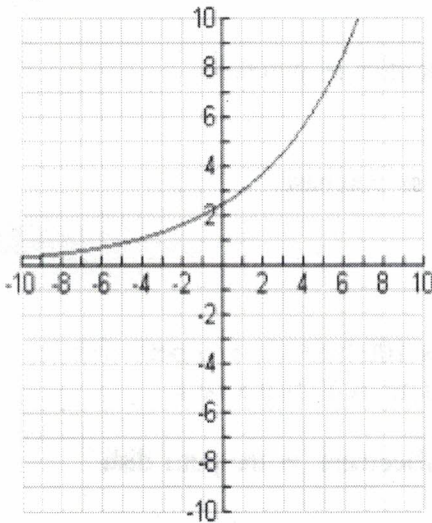
I. For each equation below, identify the equation as either exponential growth or decay, the initial value, the growth or decay rate, and the y-intercept.

1.  $y = 3.34(1.67)^x$

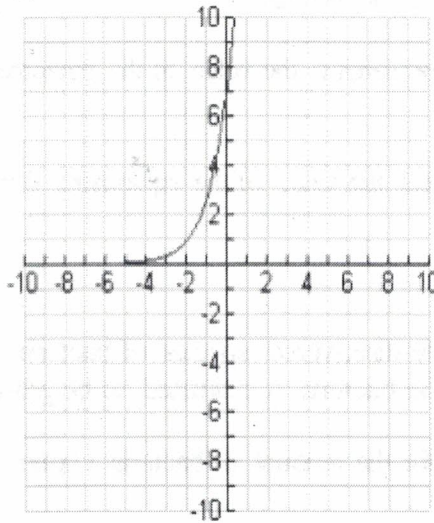
2.  $y = 8(.54)^x$

3.  $y = 4.5(4)^x$

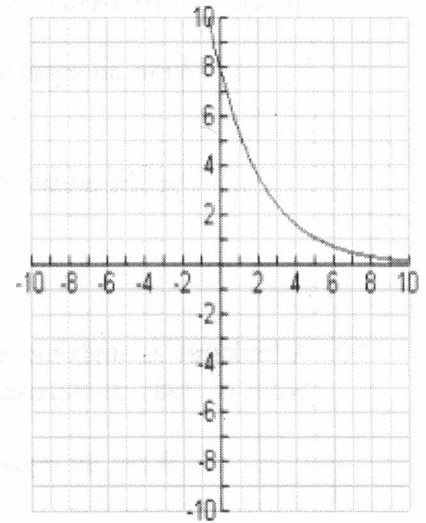
4.



5.



6.



---

*Growth*:  $y = P(1+r)^t$

*Decay*:  $y = P(1-r)^t$

---

II. Use the exponential growth or decay formulas to answer the following real-world models.

7. It is estimated that the population of the world is increasing at an average annual rate of 1.3%. The population was about 6,472,416,997 in the year 2005.
- Write an equation for the population  $t$  years after 2005.
  - Use the equation to find the population of the world in 2015 and 2025.