

Exploring Exponential Functions

For each equation below, identify the equation as exponential growth or decay, its initial value, the growth (or decay) factor, and the growth (or decay) rate.

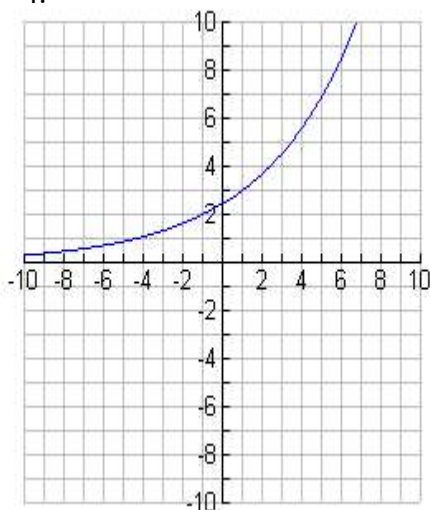
1. $y = 3.34(1.67)^x$

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

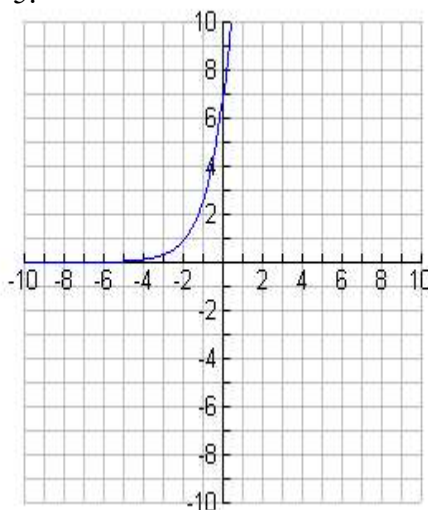
3. $y = 4.5(4)^x$

For each graph below, identify the graph as exponential growth or decay, and estimate its initial value.

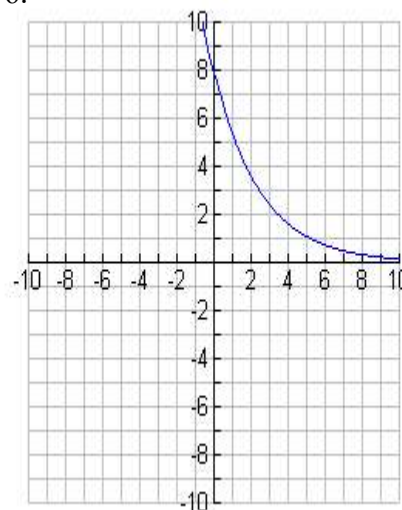
4.



5.



6.



For each table below, identify the equation as exponential growth or decay, its initial value, the growth (or decay) factor, the growth (or decay) rate, and write the equation of the exponential represented in the table.

7.

x	y
2	136.89
3	106.77
4	82.284
5	64.961
6	50.67

8.

x	y
4	180.55
5	241.94
6	324.2
7	434.43
8	582.14

9.

x	y
1	17.325
2	26.681
3	41.088
4	63.275
5	97.444

10. 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 predict the population of the world in 2015 and 2025.

11. 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 predict the amount of forested area in 2010 and 2020.

12. 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 predict the value of the equipment 6 years after its purchase.
13. 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.
 - How much bacteria will there be after 12 hours?
14. The population of rabbits in a national forest has been declining by $\frac{1}{20}$ 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.
15. The table below shows the ending balance of a college savings account for each year listed.

Year	Amount
2008	\$10,991
2009	\$11,343
2010	\$11,706
2011	\$12,080

- If the savings account was opened in 2005, what was the initial amount invested in the college savings account?
- Write an exponential equation that models the amount in the savings account n years since 2005.
- If the student that the account was created for is to enter college in the fall of 2017, how much money will be in the account?