

1. Completely simplify and use the properties of exponents to rewrite each expression with no negative exponents.

a. $(-3mn^3)^3(2m^5n)$ b. $(4k^2d)(-5kd^3)$ c. $3x(2xy^2)^4$ d. $(3h^4)(g^4h)^2(-2g^2)^3$

e. $3x^6 \cdot 7x^{15}$ f. $(12a^2b)(3ab^5)$ g. $(10m^4t^9)^2$ h. $(-15m^3t)(m^{18}t^4)$

2. Write each percent change as a constant multiplier.

a. 46% decrease b. 7.8% increase c. 105% increase d. 13% decrease

3. You were given a stamp collection 10 years ago. Its value at that time was \$1,200. The collection appreciates at a rate of 6% per year.

- Write an equation that models this situation. Be sure to define your variables.
- Find out how much the stamp collection is worth today.
- How much will the stamp collection be worth in 5 years?

4. Determine the rate of growth or decay for the following equations:

a. $y = 4(1.78)^x$

b. $y = 14(1.078)^x$

c. $y = 3(.74)^x$

d. $y = 10(.33)^x$

5. In each of the above equation in #3, find the value of y when x equals 12.

6. You left your sandwich in your lunch box over break and found that it has mold growing on it. You know that mold exponentially grows at a rate of 8% a day. When initially measure the sample you find 40 mg on the bread.

- Write an equation that models this situation. Be sure to define your variables.
- Find out how much mold will be on the bread in 1 week.
- Find out how much mold was on the bread when you left for break 15 days ago.

7. For each table, write the equation in the form $y = a \cdot b^x$.

a.

x	y
0	5
1	7.5
2	11.25
3	16.875

b.

x	y
0	780
2	280.8
3	168.48
5	60.6528