

Name \_\_\_\_\_ Period \_\_\_\_\_ Date \_\_\_\_\_

Vocabulary: Define each word and give an example.

1. Exponent
2. Product of Powers Property of Exponents

Short Answer:

3. Describe how to evaluate a base raised to a negative exponent. Show using patterns why this is true.
4. Describe how to write a number that is in scientific notation in standard (decimal) form.

Problems:

**\*\*Be sure to show all work used to obtain your answer. Circle or box in the final answer.\*\***

5. Simplify the following expressions.

a.  $(2xy)^3(x^2)$

b.  $(-9x^3)^2$

c.  $(abc^2)^3(a^2b)^2$

6. Evaluate the exponential expressions.

a.  $-5^2$

b.  $8(2)^{-3}$

c.  $2^0 \cdot 3^2$

7. Simplify. Rewrite each expression with positive exponents.

a.  $(-6)^2 xy^{-1}$

b.  $\frac{4}{2m^{-5}}$

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

d.  $\left(\frac{-6x^2y}{2xy^3}\right)^3$

8. Rewrite the number in decimal form.

a.  $1.228 \times 10^6$

b.  $6.82 \times 10^{-5}$

9. Rewrite the number in scientific notation.

a. 7,500,000

b. 0.00000156

10. Evaluate the expression. Write your final answer in scientific notation.

a.  $(4 \times 10^6)(3 \times 10^8)$

b.  $\frac{5.5 \times 10^{-2}}{1.1 \times 10^{-4}}$

c.  $(3 \times 10^5)^4$

Multiple Choice Section: **Circle the best answer.**

11. Determine the value of  $2^3 \cdot 2^4$ .

- A. 48
- B. 64
- C. 96
- D. 128

12. Divide:  $\frac{6.0 \times 10^{-5}}{3.0 \times 10^{-3}}$ . What is the quotient in scientific notation?

- A.  $0.2 \times 10^{-8}$
- B.  $0.2 \times 10^{-2}$
- C.  $2.0 \times 10^{-8}$
- D.  $2.0 \times 10^{-2}$

13. Which expression is equivalent to  $(a^2bc^3)(3a^3bc^4)^2$ ?

- A.  $6a^{12}b^2c^{24}$
- B.  $6a^8b^3c^{11}$
- C.  $9a^{12}b^2c^{24}$
- D.  $9a^8b^3c^{11}$

14. Simplify the following expression using only positive exponents:  $(-10a)^0 x^{-2}$

- A.  $\frac{1}{x^2}$
- B.  $\frac{-10a}{x^2}$
- C.  $10ax^2$
- D.  $-x^2$