

Date:

Title:

(A) Lesson Objectives:

- a. Introduce the meaning of exponents, bases, powers.
- b. Investigate the multiplication of powers to show the Product Law of Exponents.
- c. Practice using the Product Law of Exponents.

(B) Investigations for Classwork: Definitions of Key Terms:

- a. In the equation $3^4 = 81$, the following are the key terms that we will be using in our lessons
- b. 3 is referred to as the _____.
- c. 4 is referred to as the _____.
- d. The expression 3^4 or the result of 81 are referred to as _____.

- e. In the equation $b^x = y$, the following are the key terms that we will be using in our lessons
- f. b is referred to as the _____.
- g. x is referred to as the _____.
- h. The expression b^x or the result of y are referred to as _____.

- i. In the expression 3^4 , the exponent tells how many times the base is used as a **factor** in the product
- j. So when we “expand” 3^4 , we write it as _____.
- k. So when we “expand” x^3 , we write it as _____.
- l. So when we “expand” $(-6)^4$, we write it as _____.
- m. So when we “expand” -6^4 , we write it as _____.
- n. So when we “expand” $(x + 5)^3$, we write it as _____.
- o. So when we “expand” $(2x)^4$, we write it as _____.

- p. Express each of the following with an equivalent expression involving exponents:
 - i. $z \times z \times z \times z \times z =$ _____.
 - ii. $6 \times 6 \times 6 =$ _____.
 - iii. $2a \times 2a \times 2a \times 2a =$ _____.
 - iv. $x \times x \times y \times y \times y =$ _____.
 - v. $(x + y)(x + y)(x + y) =$ _____.
 - vi. $a \times a \times a \times b \times b =$ _____.
 - vii. $(2x)(2x)(2x) =$ _____.
 - viii. $(2x)(2x) y \times y =$ _____.

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(C) Investigations for Classwork: Multiplying Powers:

- a. Consider the product $x^4 \times x^3$
- b. Write both parts of this product as extended products: $x^4 =$ _____ and $x^3 =$ _____.
- c. Write the product $x^4 \times x^3$ as an expanded product and in terms of an equivalent expression involving an exponent : _____.

- d. Express each of the following products as a single variable raised to an exponent.
 - i. $x^2 \times x^7 =$ _____.
 - ii. $x^6 \times x^2 =$ _____.
 - iii. $a^2 \times a^3 \times a^4 =$ _____.
 - iv. $y^2 \times y^6 \times y^{10} =$ _____.
 - v. $x^6 \times y^2 =$ _____.
 - vi. $b^6 \times d^2 =$ _____.

(D) Algebraic Examples – In Class

<http://www.teacherweb.com/NY/Arlington/AlgebraProject/U6L1.ExponentProperties-MultDiv.pdf>

(E) Homework/Resources

- **HW: from Textbook** →

- Video help from OnlineMathLearning with inequalities:
 - o <http://www.youtube.com/watch?v=LVDHfmc3s60>
 - o <http://www.onlinemathlearning.com/exponent-rules.html>

- Reading from PurpleMath → <http://www.purplemath.com/modules/exponent.htm>