

Name: \_\_\_\_\_ Hour: \_\_\_\_\_ Date: \_\_\_\_\_

## NOTES: Section 8.1 – Multiplication Properties of Exponents

Goals: #1 - I can use multiplication properties of exponents.



*Homework: Section 8.1 Worksheet*

**Exploration #1:** Work with a partner and answer the following questions.

1. How can you write  $7^2$  as products?
2. How can you write  $7^3$  as products?
3. How can you multiply  $7^2 \cdot 7^3$ ? What about  $x^3 \cdot x^4$ ? Can you write your answer using exponents?
4. Complete:  $a^m \cdot a^n = a^{\boxed{\phantom{000}}}$

**Notes:**

**5<sup>3</sup>**

To \_\_\_\_\_ powers that have the \_\_\_\_\_ base, we \_\_\_\_\_ the exponents.

**Example:**

**Example #1:** Simplify the expression. Write your answer using exponents.

1.  $5^3 \cdot 5^6$
2.  $-2(-2)^4$
3.  $x^2 \cdot x^3 \cdot x^4$

**You practice:** Simplify the expression. Write your answer using exponents.

1.  $4^2 \cdot 4^3$
2.  $a \cdot a^7$
3.  $(-3)^2(-3)$

Name: \_\_\_\_\_ Hour: \_\_\_\_\_ Date: \_\_\_\_\_

**Exploration #2:** Work with a partner and answer the following questions.

1. How can you write  $(7^3)^2$  as products? Can you write your answer using exponents?

2. How can you write  $(x^5)^3$  as products? Can you write your answer using exponents?

3. Complete:  $(a^m)^n = a^{\boxed{\phantom{000}}}$

Notes:

$$(5^3)^2$$

To raise a \_\_\_\_\_ to another \_\_\_\_\_ we \_\_\_\_\_ the exponents.

**Example:**

**Example #2:** Simplify the expression. Write your answer using exponents.

1.  $(3^3)^2$

2.  $[(-3)^5]^2$

3.  $(p^4)^4$

**You practice:** Simplify the expression. Write your answer using exponents.

1.  $(4^4)^3$

2.  $(n^4)^5$

3.  $[(-5)^2]^3$

Name: \_\_\_\_\_ Hour: \_\_\_\_\_ Date: \_\_\_\_\_

**Exploration #3:** Work with a partner and answer the following questions.

1. How can you write  $(5 \cdot 4)^2$  as products? Can you write your answer using exponents?
2. How can you write  $(x \cdot y)^3$  as products? Can you write your answer using exponents?
3. Complete:  $(a \cdot b)^m = a^{\square} b^{\square}$

**Notes:**

$$(5 \cdot 2)^3$$

To find a power of a \_\_\_\_\_, find the \_\_\_\_\_ of each factor and \_\_\_\_\_.

**Example:**

**Example #3:** Simplify the expression. Write your answer using exponents.

1.  $(-6 \cdot 5)^2$
2.  $(4yz)^3$
3.  $(2w)^6$

**You practice:** Simplify the expression. Write your answer using exponents.

2.  $(2 \cdot 4)^3$
2.  $(4xy)^4$
3.  $(-3 \cdot 4)^2$

Name: \_\_\_\_\_ Hour: \_\_\_\_\_ Date: \_\_\_\_\_

Notes:

- \_\_\_\_\_:

Property:	Algebraic Expression:	Example:
Product of Powers Property		
Power of a Power Property		
Power of a Product Property		

**Example #4:** Simplify the expression.

1.  $(4x^2)^3 \cdot x^5$

2.  $9 \cdot (9z^5)^2$

**You practice:** Simplify the expression.

1.  $(n^2)^3 \cdot n^7$

2.  $(3x^4)^2 \cdot x^3$