Name _____ Date _____ Class _____

LESSON 7-3

Algebra Lab Recording Sheet pp. 458–459

Explore Properties of Exponents

Try This

Activity 1

1. Complete the table below.

$3^2 \cdot 3^3 = (3 \cdot 3) \cdot (3 \cdot 3 \cdot 3) = 3^{\square}$

_____

$5^4 \cdot 5^2 = (\square \cdot \square \cdot \square \cdot \square) \cdot (\square \cdot \square) = 5^{\square}$

_____

$4^3 \cdot 4^3 = (\square \cdot \square \cdot \square) \cdot (\square \cdot \square \cdot \square) = \square^6$

_____

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

_____

$6^3 \cdot 6^4 = (\quad) \cdot (\quad) =$ _____

2. Examine your completed table. Look at the two exponents in each factor and the exponent in the final answer. What pattern do you notice?

_____

3. Use your pattern to make a conjecture: $a^m \cdot a^n = a^{\square}$

_____

Try This

Use your conjecture to write each product below as a single power.

1. $5^3 \cdot 5^5$ _____

2. $7^2 \cdot 7^2$ _____

3. $10^8 \cdot 10^4$ _____

4. $8^7 \cdot 8^3$ _____

5. Make a table similar to the one above to explore what happens when you multiply more than powers that have the same base. Then write a conjecture in words to summarize what you find.

_____

_____

Name _____ Date _____ Class _____

LESSON 7-3

Algebra Lab Recording Sheet pp. 458–459

Explore Properties of Exponents continued

Activity 2

1. Complete the table below.

$(2^3)^2 = 2^3 \cdot 2^3 = (\square \cdot \square \cdot \square) \cdot (\square \cdot \square \cdot \square) = 2^{\square}$

_____

$(2^2)^2 = \square \cdot \square \cdot \square = (\square \cdot \square) \cdot (\square \cdot \square) \cdot (\square \cdot \square) = \square$

_____

$(4^2)^4 = \square \cdot \square \cdot \square \cdot \square = (\square \cdot \square) \cdot (\square \cdot \square) \cdot (\square \cdot \square) \cdot (\square \cdot \square) = \square$

_____

$(3^4)^2 = \square \cdot \square = (\square \cdot \square \cdot \square \cdot \square) \cdot (\square \cdot \square \cdot \square \cdot \square) = \square$

_____

$(6^3)^4 =$ _____ $=$ _____ $=$ _____

2. Examine your completed table. Look at the two exponents in the original expression and the exponent in the final answer. What pattern do you notice?

_____

3. Use your pattern to make a conjecture: $(a^m)^n = a^{\square}$

_____

Try This

Use your conjecture to write each product below as a single power.

4. $(5^3)^2$ _____

5. $(7^2)^2$ _____

6. $(3^3)^4$ _____

7. $(9^7)^3$ _____

Name _____ Date _____ Class _____

LESSON 7-3

Algebra Lab Recording Sheet pp. 458–459

Explore Properties of Exponents continued

8. Make a table similar to the one in Activity 2 to explore what happens when you raise a power to two powers, for example, $\left[(4^2)^3\right]^3$. Then write a conjecture in words to summarize what you find.

_____

_____

Activity 3

1. Complete the table below.

$(ab)^3 = (ab) \cdot (ab) = (a \cdot a \cdot a) \cdot (b \cdot b \cdot b) = a^3b^3$

_____

$(mn)^4 = \square \cdot \square \cdot \square \cdot \square = (\square \cdot \square \cdot \square \cdot \square) \cdot (\square \cdot \square \cdot \square \cdot \square) = \square^{\square} \cdot \square^{\square}$

_____

$(xy)^2 = \square \cdot \square = (\square \cdot \square) \cdot (\square \cdot \square) = \square^{\square} \cdot \square^{\square}$

_____

$(cd)^5 = (\square) \cdot (\square) \cdot (\square) \cdot (\square) \cdot (\square) = (\square \cdot \square \cdot \square \cdot \square \cdot \square) \cdot (\square \cdot \square \cdot \square \cdot \square \cdot \square) = \square^{\square} \cdot \square^{\square}$

_____

$(pq)^6 =$ _____

2. Examine your completed table. Look at the original expression and the final answer. What pattern do you notice?

_____

3. Use your pattern to make a conjecture: $(ab)^n = a^{\square}b^{\square}$

_____

Name _____ Date _____ Class _____

LESSON 7-3

Algebra Lab Recording Sheet pp. 458–459

Explore Properties of Exponents continued

Try This

Use your conjecture to write each product below as a product.

11. $(rs)^8$ _____

12. $(yz)^9$ _____

13. $(ab)^7$ _____

14. $(xz)^{12}$ _____

15. Look at the first row of your table. What property or properties allows you to write $(ab) \cdot (ab) \cdot (ab)$ as $(a \cdot a \cdot a) \cdot (b \cdot b \cdot b)$?

_____

16. Make a table similar to the one in Activity 3 to explore what happens when you raise a product containing more than two factors to a power, for example, $(xyz)^7$. Then write a conjecture in words to summarize what you find.

_____

_____