

## 5.2 MORE PROPERTIES OF EXPONENTS DISCOVERY ACTIVITY

USING WHAT YOU KNOW, WHAT DO YOU THINK (GUESS) THIS EXPRESSION SIMPLIFIES TO?

$$(W^2)^4$$

USE THE DEFINITION OF AN EXPONENT TO SIMPLIFY:

1.  $(W^2)^4$

WRITE IT OUT:

$$(W^2)(W^2)(W^2)(W^2)$$

USE PRODUCT RULE:

$$W^{2+2+2+2} = W^8$$

COMPARE THE ANSWER TO YOUR GUESS ABOVE.

USE THE DEFINITION OF AN EXPONENT TO SIMPLIFY:

2.  $(X^4)^3$

WRITE IT OUT:

$$( \quad ) ( \quad ) ( \quad )$$

USE PRODUCT RULE:

$$X \text{ --- } ^+ \text{ --- } ^+ \text{ --- } = \underline{\hspace{2cm}}$$

USE THE DEFINITION OF AN EXPONENT TO SIMPLIFY:

3.  $(A^8)^4$

WRITE IT OUT:

$$( \quad ) ( \quad ) ( \quad ) ( \quad )$$

USE PRODUCT RULE:

$$A \text{ --- } ^+ \text{ --- } ^+ \text{ --- } ^+ \text{ --- } = \underline{\hspace{2cm}}$$

### POWER RULE FOR EXPONENTS

$$(b^m)^n =$$

WHEN RAISING POWERS TO POWERS, \_\_\_\_\_ THE EXPONENTS

USE THE POWER RULE FOR EXPONENTS TO SIMPLIFY THE FOLLOWING EXPRESSIONS:

$$(Y^2)^4$$

$$(W^2 W^3)^5$$

USING WHAT YOU KNOW, WHAT DO YOU THINK (GUESS) THIS EXPRESSION SIMPLIFIES TO?

$$(X^2 Y)^3$$

USE THE DEFINITION OF AN EXPONENT TO SIMPLIFY:

4.  $(X^2 Y)^3$

WRITE IT OUT:

$$(X^2 Y)(X^2 Y)(X^2 Y)$$

USE PRODUCT RULE:

$$X^{2+2+2} Y^{1+1+1} = X^6 Y^3$$

COMPARE THE ANSWER TO YOUR GUESS ABOVE.

USE THE DEFINITION OF AN EXPONENT TO SIMPLIFY:

5.  $(3Q^4 R^5)^2$

WRITE IT OUT:

$$( \quad ) ( \quad )$$

USE PRODUCT RULE:

$$\underline{\quad} Q \underline{\quad} R \underline{\quad} = \underline{\quad}$$

## POWER OF A PRODUCT PROPERTY

(PRODUCT TO POWER RULE)

$$(a b)^m =$$

IF ALL OF THE COEFFICIENTS AND VARIABLES ARE MULTIPLIED TOGETHER INSIDE THE PARENTHESES, THEN \_\_\_\_\_ EACH COEFFICIENT AND VARIABLE TO THE \_\_\_\_\_.

USE THE POWER OF A PRODUCT RULE FOR EXPONENTS TO SIMPLIFY THE FOLLOWING EXPRESSIONS:

$$(6A B^2)^2$$

$$(- 4 J^2 K^3)^3$$

$$(- 2 W^4 Y)^4$$

USING WHAT YOU KNOW, WHAT DO YOU THINK (GUESS) THIS EXPRESSION SIMPLIFIES TO?

$$\left(\frac{3}{4}\right)^3$$

USE THE DEFINITION OF AN EXPONENT TO SIMPLIFY:

4.  $\left(\frac{3}{4}\right)^3$

WRITE IT OUT:

$$\left(\frac{3}{4}\right)\left(\frac{3}{4}\right)\left(\frac{3}{4}\right)$$

USE PRODUCT RULE:

$$\frac{3 \cdot 3 \cdot 3}{4 \cdot 4 \cdot 4} = \frac{27}{64}$$

COMPARE THE ANSWER TO YOUR GUESS ABOVE.

USE THE DEFINITION OF AN EXPONENT TO SIMPLIFY:

5.  $\left(\frac{2X^3}{Y^5}\right)^4$

WRITE IT OUT:

$$\left(\frac{\quad}{\quad}\right)\left(\frac{\quad}{\quad}\right)\left(\frac{\quad}{\quad}\right)\left(\frac{\quad}{\quad}\right)$$

USE PRODUCT RULE:

$$\frac{X_{\text{---+---+---}}}{Y_{\text{---+---+---}}} = \text{_____}$$

## POWER OF A QUOTIENT PROPERTY

(QUOTIENT TO POWER RULE)

$$\left(\frac{a}{b}\right)^m =$$

IF ALL OF THE COEFFICIENTS AND VARIABLES ARE MULTIPLIED/DIVIDED TOGETHER INSIDE THE PARENTHESES, THEN \_\_\_\_\_ EACH COEFFICIENT AND VARIABLE TO THE \_\_\_\_\_.

USE THE POWER OF A QUOTIENT RULE FOR EXPONENTS TO SIMPLIFY THE FOLLOWING EXPRESSIONS:

$$\left(\frac{2}{3}\right)^4$$

$$\left(\frac{2A^2}{B^3}\right)^3$$