Pre-Algebra Workbook

Exponents

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EXPONENTS

■ 1. An exponent tells us how many times to multiply the base by _____.

■ 2. Is 2^3 the same as 3^2? Why or why not?

■ 3. Find the sum.

$$5^3 + 2^4$$

■ 4. Write the number using exponents.

$$2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$$

■ 5. Write the following number without an exponent.

$$1^6$$

■ 6. Write the number without an exponent.

$$(-9)^6$$

RULES OF EXPONENTS

■ 1. Find the sum.

$$2x^3 + x^3 + x^3 + 3x^3$$

■ 2. Find the product.

$$x^6 \cdot x^2 \cdot x^3$$

■ 3. Simplify the expression.

$$x \cdot x \cdot x$$

■ 4. Stephanie and Jimmy are trying to find a shortcut to simplify the expression below. Stephanie says that they should add the exponents $(3 + 5 = 8)$ and then raise 4 to that power. Jimmy says that since it's multiplication, they should multiply the exponents $(3 \cdot 5 = 15)$ and then raise 4 to that power. Who is correct and why?

$$4^3 \cdot 4^5$$

■ 5. Simplify the expression.

$$\frac{x^5 + x^2 \cdot x^3}{x^7}$$

6. Simplify the expression.

$$\frac{x^{-4} \cdot x^6}{x^2}$$

POWER RULE FOR EXPONENTS

■ 1. The power rule tells us that, when we raise a power to a power, we can _____ those powers together.

■ 2. Simplify the expression.

$$(x^3)^3$$

■ 3. Simplify the expression.

$$(x^2)^{-4}$$

■ 4. Simplify the expression.

$$(2^m)^p$$

■ 5. Simplify the expression.

$$(x^2y^2)^3$$

■ 6. Simplify the expression.

$(x^{-5} \cdot x^{4})^{-2}$

NEGATIVE AND OTHER EXPONENT RULES

■ 1. Simplify the expression.

$$\frac{9a^5b^4}{3a^2b^7}$$

■ 2. Simplify the expression.

$$\frac{2x^0y^6 - (y^2)^3}{x^6}$$

■ 3. Simplify the expression.

$$\frac{(x^{2p})^3}{x^{3p}y^{3p}}$$

■ 4. Simplify the expression.

$$\frac{(x^{-3a+4})^2}{x^{-4a+8}y^{-2a}}$$

■ 5. Simplify the expression.

$$\left(\frac{5x^{-2}}{y^{-2}}\right)^4$$

6. Simplify the expression.

$$\left(\frac{2x^5y^7}{y^{12}}\right)^0$$

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