

Start correcting your hw from Tuesday. If you did not do it, please fill out a no homework form at the back table near the door.

7-3

## Practice (continued)

Form G

## More Multiplication Properties of Exponents

Complete each equation.

40.  $(p^4)^\square = p^8$

2

41.  $(z^\square)^6 = z^{-24}$

-4

42.  $(t^{12})^\square = 1$

0

43.  $(w^3)^\square = w^{-12}$

-4

44.  $(n^{-8})^\square = n$

-1/8

$(n)^1 = n$

$-\frac{8}{1} \cdot \frac{1}{8} = 1$

45.  $10(g^2)^\square = 10g^6$

3

46.  $(3a^\square)^3 = 27a^{\frac{3}{2}}$

1/2

$$(3a^{\frac{1}{2}})^3$$

$$3^3 a^{\frac{1}{2} \cdot 3}$$

$$27a^{\frac{3}{2}}$$

47.  $(6q^4r^\square)^2 = 36q^8$

0

$$\frac{1}{2} \cdot \frac{3}{1} = \frac{3}{2}$$

48.  $(x^4y^3)^\square = \frac{1}{x^8y^6}$

-2

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Hand back Quiz and go over.

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The zero exponent property states any number raised to the zero power is 1.

$$x^0 = 1$$

Any number with a negative exponent is the reciprocal of that number raised to the absolute value of the exponent.

$$\frac{x^{-a}}{1} = \frac{1}{x^a} \quad \text{or} \quad \frac{1}{x^{-a}} = \frac{x^a}{1} = x^a$$

**Rewrite using only positive exponents.**

$$1.) \frac{2^{-8}}{1} = \frac{1}{2^8} = \frac{1}{256}$$

$$2.) \frac{1}{x^{-3}} = x^3$$

$$\boxed{2} \boxed{y^x} \boxed{8} =$$

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To multiply monomials, use the \_\_\_\_\_ of exponents.

$$x^a \cdot x^b = x^{a+b}$$

**Find each product.**

$$1.) g^2 \cdot g^6 = g^{2+6} = g^8$$

$$2.) 8^{-5} \cdot 8^3 = 8^{-5+3} = 8^{-2} = \frac{1}{8^2} = \frac{1}{64}$$

**Examples with Coefficients:**

- MULTIPLY the coefficients.
- SIMPLIFY the variables with the product rule.

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

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

$$20x^5$$

$$2.) -7p^9q^3r \cdot -3p^2q^5r^4$$

$$(-7 \cdot -3)(p^9 p^2)(q^3 q^5)(r r^4)$$

$$21p^{11}q^8r^5$$

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To divide monomials, use the \_\_\_\_\_ of exponents.

$$\frac{x^a}{x^b} = x^{a-b}$$

$$\frac{x^a}{x^b} = \frac{1}{x^{b-a}}$$

**Find each quotient.**

1.)  $\frac{x^3}{x} = x^{3-1} = x^2$

2.)  $\frac{7^8}{7^5} = 7^{8-5} = 7^3 = 343$

**Examples with coefficients**

1. DIVIDE the coefficients
2. SIMPLIFY the variables with the quotient rule.

$$\boxed{7} \boxed{y^x} \boxed{3} \boxed{=}$$

1.)  $\frac{14r^2s^2}{7rs} = \frac{14}{7} \cdot \frac{r^2}{r} \cdot \frac{s^2}{s}$   

$$\boxed{2rs}$$

2.)  $\frac{3x^5y^3z}{15x^2y^4} = \frac{3}{15} \cdot \frac{x^5}{x^2} \cdot \frac{y^3}{y^4} \cdot \frac{z}{1}$   

$$\frac{x^3z}{5y}$$

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To raise a monomial to a power, use the \_\_\_\_\_.

$$(x^a)^b = x^{ab}$$

**Simplify.**

1.)  $(n^3)^4 = n^{12}$

2.)  $(m^2n)^3 = m^6n^3$

**Examples with Coefficients:**

1. RAISE the coefficient to the given power.
2. SIMPLIFY the variables with the power rule.

1.)  $(5x^7)^2$   

$$5^2 x^{14}$$
  

$$\boxed{25x^{14}}$$

2.)  $(-4c^3d^4)^4$   

$$(-4)^4 c^{12} d^{16}$$
  

$$\boxed{256c^{12}d^{16}}$$

$$\underbrace{(-4)(-4)(-4)(-4)}_{16 \cdot 16}$$

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To raise of quotient quotient to a power, use the \_\_\_\_\_ of a \_\_\_\_\_ property.

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

**Simplify.**

$$1.) \left(\frac{g^3}{h}\right)^4 = \frac{(g^3)^4}{(h)^4} = \frac{g^{12}}{h^4}$$

$$2.) \left(\frac{a^{-4}}{b^2}\right)^2 = \frac{(a^{-4})^2}{(b^2)^2} = \frac{a^{-8}}{b^4} = \frac{1}{a^8 b^4}$$

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$$1.) 3x^2y \cdot -5x^3y^4 = -15x^5y^5$$

$$2. \left(\frac{3x^2}{2y^2}\right)^5 = \frac{(3x^2)^5}{(2y^2)^5} = \frac{3^5 x^{10}}{2^5 y^{10}} = \frac{243x^{10}}{32y^{10}}$$

$$3. \frac{4x^3y^4}{2 \cdot xy^2z} = \frac{4x^2y^2}{2z}$$

$$4. \frac{1x^{14}y^{11}}{18x^2} = \frac{x^{12}y^{11}}{18}$$

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$$5. \frac{(2x^3) \cdot (x^4)^2}{8x^{11}}$$

$$\frac{2x^3 \cdot x^8}{8x^{11}} = \frac{2x^{11}}{8x^{11}} = \frac{1}{4}$$

$$6. (10g^3h^8v^6)(11gh^8)$$

$$(10 \cdot 11)(g^3g)(h^8h^8)v^6$$

$$110g^4h^{16}v^6$$

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There will be a quiz over Exponent Rules on Tuesday, September 4. I highly recommend that you work through the Kuta Properties of Exponents worksheet. This is not required hw, but would greatly help you prepare for the quiz. The answers to the ws are posted on my website.

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