

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Math 9**  
**Lesson 2.5 ~ Exponent Laws (Part 2)**

**Power of a Power**

Power	As Repeated Multiplication	As a Product of Factors	As a Power
$(2^4)^3$			
$(3^2)^4$			
$[(-4)^3]^2$			

**Exponent Law for a Power of a Power:**

$$(a^m)^n = a^{m \times n} \quad a \neq 0$$

To raise a power to a power, multiply the exponents. The variable  $a$  is any integer, except 0. The variables  $m$  and  $n$  are any whole numbers.

**Power of a Product**

Power	As Repeated Multiplication	As a Product of Factors	As a Product of Powers
$(2 \times 5)^3$			
$(3 \times 4)^2$			
$(5 \times 3)^4$			

**Exponent Law for a Power of a Product:**

$$(a \times b)^m = a^m \times b^m \quad a, b \neq 0$$

The variables  $a$  and  $b$  are any integers, except 0. The variable  $m$  is any whole number.

**Exponent Law for a Power of a Quotient:**

$$(a \div b)^n = a^n \div b^n \quad a, b \neq 0$$

The variables  $a$  and  $b$  are any integers, except 0. The variable  $m$  is any whole number.

**Example # 1:** Write  $[(-7)^3]^4$  as a power.

**Example # 2:** Evaluate  $(6 \times 7)^2 + [(-3)^8 \div (-3)^6]^3$ .

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## Practice

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1. Write as a product of powers.

a)  $(5 \times 2)^4 =$

b)  $(12 \times 13)^2 =$

c)  $[3 \times (-2)]^3 =$

d)  $[(-4) \times (-5)]^5 =$

2. Write as a quotient of powers.

a)  $(5 \div 8)^0 =$

b)  $[(-6) \div 5]^7 =$

c)  $\left(\frac{3}{5}\right)^2 =$

d)  $\left(\frac{-1}{-2}\right)^3 =$

3. Write as a power.

a)  $(5^2)^3 =$

b)  $[(-2)^3]^5 =$

c)  $(4^4)^1 =$

d)  $(8^0)^3 =$

4. Evaluate.

a)  $[(6 \times (-2))^2 =$

b)  $-(3 \times 4)^2 =$

c)  $\left(\frac{-8}{-2}\right)^2 =$

d)  $(10 \times 3)^1 =$

e)  $[(-2)^1]^2 =$

f)  $[(-2)^1]^3 =$

5. Find any errors and correct them.

a)  $(3^2)^3 = 3^5$

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b)  $(3 + 2)^2 = 3^2 + 2^2$

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c)  $(5^3)^3 = 5^9$

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d)  $\left(\frac{2}{3}\right)^8 = \frac{2^8}{3^8}$

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e)  $(3 \times 2)^2 = 36$

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f)  $\left(\frac{2}{3}\right)^2 = \frac{4}{6}$

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g)  $[(-3)^3]^0 = (-3)^3$

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h)  $[(-2) \times (-3)]^4 = -6^4$

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**2.4** 8. Write as a power.

a)  $6^3 \times 6^7 =$

b)  $(-4)^2 \times (-4)^3 =$

c)  $(-2)^5 \times (-2)^4 =$

d)  $10^7 \times 10 =$

9. Write as a power.

a)  $5^7 \div 5^3 =$

b)  $\frac{10^5}{10^3} =$

c)  $(-6)^8 \div (-6)^2 =$

d)  $\frac{5^{10}}{5^6} =$

e)  $8^3 \div 8 =$

f)  $\frac{(-3)^4}{(-3)^0} =$

**2.5** 10. Write as a power.

a)  $(5^3)^4 =$

b)  $[(-3)^2]^6 =$

c)  $(8^2)^4 =$

d)  $[(-5)^5]^4 =$

11. Write as a product or quotient of powers.

a)  $(3 \times 5)^2 =$

b)  $(2 \times 10)^5 =$

c)  $[(-4) \times (-5)]^3 =$

d)  $\left(\frac{4}{3}\right)^5 =$

e)  $(12 \div 10)^4 =$

f)  $[(-7) \div (-9)]^6 =$