

Chapter 3 – Powers and Exponents

LESSON 2: EXPONENT LAWS (PART 1)

Multiplying Powers with the Same Base

a) $5^3 \cdot 5^4$

b) $3^3 \cdot 3^2$

c) $(-2)^5 \cdot (-2)^2$

Rule: When multiplying powers with the same base, you _____ the exponents.

Dividing Powers with the Same Base

a) $\frac{5^5}{5^3}$

b) $\frac{(-5)^7}{(-5)^4}$

Rule: When dividing powers with the same base, you _____ the exponents.

Power of a Power

a) $(3^2)^3$

b) $(2^3)^3$

c) $(5^4)^2$

Rule: To raise a power to a power, _____ the exponents.

Ex.1: Write each expression as a single power, then evaluate

a) $4^5 \cdot 4^2$

b) $(-2)^4(-2)^3$

c) $5^7 \div 5^3$

d) $\frac{(-9)^7}{(-9)^6}$

Ex.2: Write each expression as a product or quotient of two powers, then as a single power.

a) $(3 \times 3 \times 3) \times (3 \times 3 \times 3 \times 3 \times 3)$

b) $(-7)(-7)(-7)(-7)(-7) \times (-7)(-7)$

c) $\frac{9 \times 9 \times 9 \times 9 \times 9 \times 9 \times 9 \times 9}{9 \times 9}$

d) $(-2)(-2)(-2)(-2) \div (-2)(-2)(-2)$

Ex.3: Write the following expression as a power raised to an exponent, then evaluate.

$$(3 \times 3 \times 3) \times (3 \times 3 \times 3) \times (3 \times 3 \times 3) \times (3 \times 3 \times 3)$$

Ex.4: Rewrite the expression 4^9

a) as a multiplication of two powers

b) as a division of two powers

c) as a power of a power

Ex.5: Ricco was asked to evaluate $\frac{9^7 \times 9^3}{9^3}$. Find and explain the mistake in his solution. What is the correct answer?

$$\begin{aligned} \frac{9^6 \times 9^3}{9^3} &= \frac{9^{6+3}}{9^3} \\ &= \frac{9^9}{9^3} \\ &= 9^9 \div 3 \\ &= 129,140,163 \end{aligned}$$