Math 9   *Name:* _____

2.4 – Exponent Laws I   *Date:* _____

Exponent Laws are rules that we use when we are <u>combining</u> and <u>simplifying</u> powers.

Investigate

Product	Each Power Expanded	Re-write as a Single Power
$3^3 \times 3^4$		
$5^4 \times 5^2$		
$(-2)^3 \times (-2)^2$		
$10^3 \times 10^0$		

Conclusion: When we MULTIPLY powers that have the same _____ we keep the

_____ and _____ the powers.

$$\rightarrow \quad b^x \times b^y =$$

Example 1: Write each expression as a single power:

a) $4^5 \times 4^7$

b) $3^9 \times 3$

c) $(-13)^{12} \times (-13)^{11}$

Example 2: Evaluate:

a) $5^2 \times 5^6$

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

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

Investigate

Quotient	Each Power Expanded	Re-write as a Single Power
$3^5 \div 3^4 = \dfrac{3^5}{3^4}$		
$5^7 \div 5^4 = \dfrac{5^7}{5^4}$		
$(-2)^6 \div (-2)^3 = \dfrac{(-2)^6}{(-2)^3}$		
$10^3 \div 10^0 = \dfrac{10^3}{10^0}$		

Conclusion: When we DIVIDE powers that have the same _____ we keep the

_____ and _____ the powers.

$$\rightarrow \quad b^x \div b^y = \frac{b^x}{b^y} =$$

Example 3: Write each expression as a single power, then evaluate:

a) $8^7 \div 8^3$

b) $3^{12} \div 3^8$

c) $(-5)^{10} \div (-5)^6$

Example 4: Evaluate using exponent laws and correct order of operations:

a) $3^3 + 3^2 \times 3^4$

b) $(-2)^5 \times (-2)^2 \div \left[(-2)^8 \div (-2)^5\right] + (-2)^3$