MPM2DI – *Unit 0: Algebraic Tools – Lesson 1*  Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Exponent Laws**

1. **Powers**A **power** consists of two parts: a base and an exponent. The base tells us which value to repeatedly multiply, and the exponent tells us how many times to perform the multiplication. For instance, 34 is a **power**. The number 3 is the base. The number 4 is the exponent. The power can be written in *exponential form* as 34 or in *expanded form* as 3 x 3 x 3 x 3.  
      
   **Example 1:**

54 🡪 base: \_*5*\_\_ exponent: \_4\_\_ 7-2 🡪 base: \_7\_\_ exponent: \_-2\_\_  
(-5)4 🡪 base: \_\_\_\_\_ exponent: \_\_\_\_\_ -54 🡪 base: \_\_\_\_\_ exponent: \_\_\_\_\_  
  
2x3 🡪 base: \_\_\_\_\_ exponent: \_\_\_\_\_ (3x)4 🡪 base: \_\_\_\_\_ exponent: \_\_\_\_\_

1. **Exponent Laws**

*\*every base will have an exponent of 1 unless otherwise written (e.g. , )*

|  |  |  |
| --- | --- | --- |
| **Exponent Law** | **Description** | **Example** |
|  | When multiplying powers with the **same base**, keep the base and **add** the exponents. |  |
|  | When dividing powers with the **same base**, keep the base and **subtract** the exponents. |  |
|  | When raising a power to an exponent, keep the base and **multiply** the exponents. |  |
|  | When raising a quotient to an exponent, keep the bases and **multiply to distribute** the exponent. |  |
|  | When raising a product to an exponent, keep the bases and **multiply to distribute** the exponent. |  |
|  | When raising a base to an exponent of 0, the value is 1. |  |
|  | When raising a base to a negative exponent, take the reciprocal of the base and make the exponent positive. |  |
|  | When raising a quotient to a negative exponent, take the reciprocal of the quotient and make the exponent positive. |  |

1. **Examples**
2. Simplify by, writing as a power of 5:
3. 53 x 54 b.  c. 53 x 5 – 3  d. 

1. Simplify using exponent laws, then evaluate:
2.  b.  c. 

d.  e. 

1. Simplify. Express each answer with positive exponents.
2.  b.  c. 

**HW {no calculator!}: Worksheet #1ghijkl, 2, 3efghij, 4, 5bdef, 6bce, 7cgjknp, 8cefhjk, 9ace, 14a**

MPM2DI – *Unit 4: Algebraic Tools – Lesson 1*  Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Worksheet: Exponent Laws**







