**2.4 – Exponent Laws (Part 1)**

INVESTIGATE

1. Complete the following table:

|  |  |  |
| --- | --- | --- |
| **Product of Powers with the Same Base** | **Product as Repeated Multiplication** | **Product as a Single Power** |
| 54 × 52 |  |  |
| (-2) × (-2)3 |  |  |
| 34 × 33 × 32 |  |  |

2. What rule can you create to reduce a product of powers with the same base to a single power?

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3. Now complete this table:

|  |  |  |
| --- | --- | --- |
| **Quotient of Powers with the Same Base** | **Quotient as Repeated Multiplication** | **Quotient as a Single Power** |
| 55 ÷ 53 or $\frac{5^{5}}{5^{3}}$ |  |  |
| (-2)3 ÷ (-2)2 or $\frac{\left(-2\right)^{3}}{\left(-2\right)^{2}}$ |  |  |
| 47 ÷ 44 or $\frac{4^{7}}{4^{4}}$ |  |  |

4. What rule can you create to reduce a quotient of powers with the same base to a single power?

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5. Use the rules you created to write the following as a single power: $\frac{\left(-7\right)^{10}\left(-7\right)^{6}(-7)}{\left(-7\right)^{13}\left(-7\right)^{2}}$

**Exponent Laws (Part 1)**

**Product of Powers:** $a^{m}×a^{n}=a^{m+n}$

**Quotient of Powers:** $a^{m}÷a^{n}=a^{m-n}$

Where *a* is any rational base, except 0; *m* and *n* are rational exponents

Ex. 1: Use the exponent laws to simplify where possible, then evaluate.

1. (–2)3 × (–2)2 (b) 910 ÷ 99 (c) $\frac{(3^{2})(3^{4})}{3^{3}}$
2. (-3)3(-3)(-3)2 (d) 42 + 43 (e) 26 – 24

Assignment: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_