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Lesson 1: Exponential Notation

Exit Ticket

1.

a. Express the following in exponential notation:

$$\underbrace{(-13) \times \cdots \times (-13)}_{35 \text{ times}}.$$

b. Will the product be positive or negative? Explain.

2. Fill in the blank:

$$\underbrace{\frac{2}{3} \times \cdots \times \frac{2}{3}}_{\_\_\_\_ \text{times}} = \left(\frac{2}{3}\right)^4$$

3. Arnie wrote:

$$\underbrace{(-3.1) \times \cdots \times (-3.1)}_{4 \text{ times}} = -3.1^4$$

Is Arnie correct in his notation? Why or why not?

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Lesson 2: Multiplication of Numbers in Exponential Form

Exit Ticket

Write each expression using the fewest number of bases possible.

1. Let a and b be positive integers. $23^a \times 23^b =$

2. $5^3 \times 25 =$

3. Let x and y be positive integers and $x > y$. $\frac{11^x}{11^y} =$

4. $\frac{2^{13}}{2^3} =$

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Lesson 3: Numbers in Exponential Form Raised to a Power

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Write each expression as a base raised to a power or as the product of bases raised to powers that is equivalent to the given expression.

1. $(9^3)^6 =$

2. $(113^2 \times 37 \times 51^4)^3 =$

3. Let x, y, z be numbers. $(x^2yz^4)^3 =$

4. Let x, y, z be numbers and let m, n, p, q be positive integers. $(x^m y^n z^p)^q =$

5. $\frac{4^8}{5^8} =$

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Lesson 4: Numbers Raised to the Zeroth Power

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1. Simplify the following expression as much as possible.

$$\frac{4^{10}}{4^{10}} \cdot 7^0 =$$

2. Let a and b be two numbers. Use the distributive law and then the definition of zeroth power to show that the numbers $(a^0 + b^0)a^0$ and $(a^0 + b^0)b^0$ are equal.

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Lesson 5: Negative Exponents and the Laws of Exponents

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Write each expression in a simpler form that is equivalent to the given expression.

1. $76543^{-4} =$

2. Let f be a nonzero number. $f^{-4} =$

3. $671 \times 28796^{-1} =$

4. Let a, b be numbers $(b \neq 0)$. $ab^{-1} =$

5. Let g be a nonzero number. $\dfrac{1}{g^{-1}} =$

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Lesson 6: Proofs of Laws of Exponents

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1. Show directly that for any nonzero integer x, $x^{-5} \cdot x^{-7} = x^{-12}$.

2. Show directly that for any nonzero integer x, $(x^{-2})^{-3} = x^{6}$.