Mar. 20, 2018

Mini Lesson #2

Exponent Laws II

TASK #2 & #3

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Example 1 Simplifying a Power of a Power

$[(-7)^3]^2 = (-7)^{3\times2} = (-7)^6$

- Expand
- Since the bases are the same, what can we do to simplify the expression?

$[(-7)^3][(-7)^3]$

$[(-7)(-7)(-7)][(-7)(-7)(-7)] = (-7)^6$

Exponent Law #3: Power of a Power

$(a^m)^n = a^{m \times n}$

Multiply Exponents

$[(-4)^2]^4$

$(-4)^8$

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Example 2:

$\left(\frac{5}{6}\right)^3$

- Expand
- Since the bases are the same, what can we do to simplify the expression?

$\left(\frac{5}{6}\right)^3 = \left(\frac{5}{6}\right)\left(\frac{5}{6}\right)\left(\frac{5}{6}\right) = \frac{5^3}{6^3}$

Exponent Law #4: Power of a Quotient

$$\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$$

Example 3

$\left(\frac{2^3}{3^4}\right)^2 =$

1st method

$\left(\frac{2^3}{3^4}\right)\left(\frac{2^3}{3^4}\right)$

$\frac{(2)(2)(2)(2)(2)(2)}{(3)(3)(3)(3)(3)(3)(3)(3)} = \frac{2^6}{3^8}$

2nd method

$\frac{2^{(3)(2)}}{3^{(4)(2)}}$

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Example 4:

$(a^2b^3)^2 = (a^2b^3)(a^2b^3)$

$a^2 \cdot a^2$

- Expand
- Since the bases are the same, what can we do to simplify the expression?

$(a^2b^3)^2 = (a^2b^3)(a^2b^3)$

$(a)(a)(b)(b)(b)(a)(a)(b)(b)(b)$

$= a^4 \cdot b^6$

Exponent Law #5: Power of a product

$$(a^m b^n)^c = a^{mc} b^{nc}$$

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