

Section 7-3 More Multiplication Properties of Exponents

Students will be able to:
-raise a power to a power
-raise a product to a power

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What does $(4^3)^2$ really mean? Draw it out.

$$(4 \cdot 4 \cdot 4)^2$$

$$4 \cdot 4 \cdot 4 \cdot 4 \cdot 4 \cdot 4 = 4^6$$

Rule for raising a power to a power?

Mult. Exp.

Mar 10-9:19 AM

Raising a Power to a Power

$$(a^m)^n = a^{mn}$$

Example:

$$(r^{1/2})^8 = r^4$$

$$r^{1/2 \cdot 8} = r^4$$

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Practice:

- $(p^5)^4 = p^{20}$
- $(p^4)^5 = p^{20}$

Why do you think this works?

Commutative prop.

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Simplify:

$$x^2(x^6)^4$$

$$x^2(x^{-24}) = x^{-22} = \frac{1}{x^{22}}$$

$$(s^{-5})^{-1/2}(s^{3/2})$$

$$(s^{5/2})(s^{3/2}) = s^{8/2} = s^4$$

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Simplify. Share with your neighbor and see if you are correct. Did you use the same method?:

$$(3x)^2 = 9x^2$$

$$3x^2 \cdot 3x^2 = 9x^4$$

$$(4^3)^6 = 6x^2$$

$$3x^1 \cdot 3x^1 = 9x^2$$

Rule for raising a product to a power?

apply to everything

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Simplify:

$$\begin{aligned} & (x^{-2})^2(3xy^5)^4 \\ & (x^{-4})(3^4x^4y^{20}) \\ & 81x^0y^{20} = 81y^{20} \\ & (6ab)^3(5a^{-3})^2 \end{aligned}$$

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#35. Simplify, write answers in scientific notation.

$$(4 \times 10^2)^5$$

$$\begin{aligned} & 4^5 \times 10^{10} \\ & 1024 \times 10^{10+3} = 1.024 \times 10^{13} \end{aligned}$$

$$1 \leq b < 10$$

Jan 23-2:26 PM

Challenge. Use the fact that if $a^x = a^y$, then $x = y$.

67. $5^6 = 25^x$

$$\begin{aligned} 5^6 &= (5^2)^x \\ 5^6 &= 5^{2x} \\ 6 &= 2x \\ 3 &= x \end{aligned}$$

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Hwk:

pg. 436 - 438
#12 - 40 (4th), 42 - 62 (evens),
66, 68, 70

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