

Name

7.1 Apply Exponent Properties

Alg I

Involving Products

I can use properties of exponents involving products.

Product of Powers Property:

* To multiply powers with the same base, add the exponents

$$a^m \cdot a^n = a^{m+n} \quad 5^6 \cdot 5^3 = 5^{6+3} = 5^9$$

$x \rightarrow +$

$$a^2 \cdot a^3 = (a \cdot a) \cdot (a \cdot a \cdot a) = a^5 = a^{2+3}$$

Ch. 7 Quiz

Example 1:

$$1) 3^2 \cdot 3^7 = 3^{2+7} = 3^9$$

$$2) 5 \cdot 5^9 = 5^1 \cdot 5^9 = 5^{1+9} = 5^{10}$$

$$3) (-7)^2(-7) = (-7)^2 \cdot (-7)^1 = (-7)^{2+1} = (-7)^3$$

$$4) x^2 \cdot x^6 \cdot x = x^2 \cdot x^6 \cdot x^1 = x^{2+6+1} = x^9$$

Power of a Power Property:

* To find a power of a power, multiply the exponents

$$(a^m)^n = a^{mn} \quad (3^4)^2 = 3^{4 \cdot 2} = 3^8$$

$$(a^2)^3 = a^2 \cdot a^2 \cdot a^2 = (a \cdot a) \cdot (a \cdot a) \cdot (a \cdot a) = a^6 = a^{2 \cdot 3}$$

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Example 2:

$$5) (4^2)^7 = 4^{2 \cdot 7} = 4^{14}$$

$$6) [(-2)^4]^5 = (-2)^{4 \cdot 5} = (-2)^{20}$$

$$7) (n^3)^6 = n^{3 \cdot 6} = n^{18}$$

$$8) [(m+1)^5]^4 = (m+1)^{5 \cdot 4} = (m+1)^{20}$$

Ch. 7 Quiz

Power of a Product Property:

* Order of magnitude: The power of 10 nearest the quantity.

Example:

91,000 closest to 10^5

* To find a power of a product, find the power of each factor and multiply

$$(ab)^m = a^m b^m = (23 \cdot 17)^5 = 23^5 \cdot 17^5$$

* Backwards distributing

Example 3/4:

$$9) (4a \cdot 12)^2 = 4a^2 \cdot 12^2$$

$$10) (-3n)^2 = (-3)^2 \cdot n^2 = 9n^2$$

$$11) (9m^3n)^4 = 9^4 \cdot m^{3 \cdot 4} n^4 = 6561 m^{12} n^4$$

$$9^4 = 9 \cdot 9 \cdot 9 \cdot 9 = 6561$$

$$12) 5 \cdot (5x^2)^4 = 5^1 \cdot 5^4 x^{2 \cdot 4} = 5^{1+4} x^8 = 5^5 x^8 = 3125 x^8$$

$$5^5 = 5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 = 3125$$

* Complete Skills Practice, pg. 438