Algebra 1

Chapter 7
Section 7-2

Expanding Powers

$3^3 \cdot 3^2 = (3 \cdot 3 \cdot 3) \cdot (3 \cdot 3) = 3^5$

When you multiply power with the same base you can add the exponents.

$3^3 \cdot 3^2 = 3^{3+2} = 3^5$

Simplify Only Each Base Once, Then Multiply

$(2^2)(2^4) =$

$(3)(3^4) =$

$(7^4)(7^{-2}) =$

2^6 64
3^5 243
7^2 49

Simplify

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

$(3h^6)(5hk^4) =$

$(x^4y^9z^3)(xy^{-4})(xz^{-1}) =$

$\dfrac{1}{a^3a^{-7}} \cdot =$

a^4b^4

$15h^7k^4$

$x^6y^5z^2$

a^4

Fraction Exponents

$5^2 = 25$

$5 = 25^{\frac{1}{2}}$

A fraction exponent (denominator) tells you how many times to multiply a number by itself to get the base.

In our example, we multiply five times five (two times) to get 25.

Using Fraction Exponents

$2 = 32^x$ What is x? $x = \dfrac{1}{5}$

**How many twos do we multiply to get 32?

$125^{\frac{1}{3}} = x$ What is x? $x = 5$

$1^{\frac{1}{7}} = x$ What is x? $x = 1$

$16^{\frac{3}{4}} = x$ What is x? $x = 8$

Scientific Notation

In scientific notation, the largest place used is the one's place.

Scientific notation is a way of "abbreviating" large numbers:

Examples: 72,000 can be written 7.2×10^4

.0543 can be written 5.43×10^{-2}

It also allows multiplying large numbers more simply:

Example: What is $(500) \cdot (7100)$?

$(5 \times 10^2)(7.1 \times 10^3)$ ---> $(5)(7.1) \cdot (10^2)(10^3)$

(35.5×10^5)

(3.55×10^6) ---> 3,550,000

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Example: What is $(10.7) \cdot (.002)$?

$(1.07 \times 10^1)(2 \times 10^{-3})$ ---> $(1.07)(2) \cdot (10^1)(10^{-3})$

(2.14×10^{-2})

.0214

Solve Using Scientific Notation

Multiply:

$(3.2 \times 10^5)(2 \times 10^7)$

$(6 \times 10^{23})(2 \times 10^{-13})$

6.4×10^{12}

$12 \times 10^{10} = 1.2 \times 10^{11}$