Lesson 4-8 Exponents and Division

Dividing by powers with the same base

- Simply subtract the exponent of the denominator from that of the numerator.

$$\frac{7^8}{7^3} = \frac{7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 \cdot 7}{7 \cdot 7 \cdot 7}$$

Rules for dividing powers with the same base

- Arithmetic

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

- Algebra

$$\frac{a^m}{a^n} =$$

$$a \neq 0 \ \text{why?}$$

Samples of Dividing Exponents with the same base

- Steps:
- Subtract Exponents
- Simplify Exponents
- Simplify

Samples

$$\frac{10^7}{10^4}$$

Samples

$$\frac{x^{23}}{x^{18}} =$$

Zero Exponents

$$\frac{3^4}{3^4} = 3^0$$

So, $a^0 =$

for $a \neq 0$

Samples Zero Exponents

$$\frac{(-8)^3}{(-8)^3} =$$

$$\frac{6b^3}{18b^3} =$$

Samples (2)

$$43^0 =$$

$$\frac{x^5 y^6}{x^5 y^3} =$$

Negative Exponents

$$\frac{3^2}{3^4} = 3^{-2}$$

$$= \underline{\quad}$$

Negative Exponents

$$\frac{5^6}{5^8}$$

- Steps
  - Subtract Exponents
  - Write with positive integers
  - Simplify

$$\frac{m^2}{m^5}$$

Samples

$$\frac{4^5}{4^7}$$

$$\frac{a^4}{a^2}$$

Writing without fraction bar

$$\frac{x^2 y^3}{x^3 y}$$

Samples

$$\frac{b^3}{b^9} =$$

Sample

$$\frac{b^{14} c^2}{b^9 c^{11}} =$$

Sample

$$\frac{18 x^{20}}{36 x^{12}}$$

Practice and Homework

- PB 4-8
- HW Lesson 4-8 (16-54 even)
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