

Pre-Algebra

November 14-18, 2011

- Monday, November 14, 2011
- SW simplify fractions using GCF and simplify algebraic fractions
- SW complete review quiz upon entering the classroom
- CW review notes students took simplifying algebraic fractions and work through examples together in class.
- SW complete class work, working with a partner
- SW begin homework if time permits

● Simplify Fractions: Write each fraction in simplest form.

Steps 1) Find the primes (factors) of the numerator & denominator

2) Cross out numbers that are the same in the numerator/denominator, replace with 1

3) Multiply what is left in the num. & denom.

1. $\frac{16}{25} = \frac{2 \cdot 2 \cdot 2 \cdot 2}{5 \cdot 5} = \frac{1 \cdot 1 \cdot 2 \cdot 2}{1 \cdot 1 \cdot 5} = \frac{4}{5}$

2. $\frac{8}{9} = \frac{2 \cdot 2 \cdot 2}{3 \cdot 3} = \text{Simplified}$

3. $\frac{16}{24} = \frac{2 \cdot 2 \cdot 2 \cdot 2}{2 \cdot 2 \cdot 2 \cdot 3} = \frac{1 \cdot 1 \cdot 1 \cdot 2}{1 \cdot 1 \cdot 1 \cdot 3} = \frac{2}{3}$

● Standardized Test Examples:

1. Six hundred sixteen yards is what part of 1 mile? (Hint: 1 mi = 1760 yds.)

a. $\frac{6}{25}$ b. $\frac{1}{4}$ c. $\frac{3}{10}$ d. $\frac{7}{20}$

$\frac{\text{yds}}{\text{miles}} = \frac{616}{1760} = \frac{2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2}{2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2} = \frac{154}{440} = \frac{77}{220} = \frac{11}{20}$

2. 250 pounds is what part of 1 ton? (Hint: 1 ton = 2000 lbs.)

a. $\frac{1}{10}$ b. $\frac{1}{8}$ c. $\frac{1}{4}$ d. $\frac{1}{2}$

$\frac{250}{2000} = \frac{25}{200} = \frac{5}{40} = \frac{1}{8}$

● Simplify Algebraic Fractions: (have variables)

Steps 1) Factor each term

2) Cross out what they have in common, replace with 1.

3) Multiply what's left

1. $\frac{25ab}{42ab^2} = \frac{5 \cdot 5 \cdot 1 \cdot b}{2 \cdot 3 \cdot 7 \cdot 1 \cdot 1 \cdot b} = \frac{5 \cdot 5 \cdot 1 \cdot 1}{2 \cdot 3 \cdot 7 \cdot 1 \cdot 1 \cdot b} = \frac{25}{42b}$

2. $\frac{x^3y}{xyz^2} = \frac{1 \cdot x \cdot x \cdot x \cdot 1 \cdot y}{1 \cdot x \cdot 1 \cdot y \cdot z \cdot z} = \frac{1 \cdot x \cdot x \cdot 1}{1 \cdot 1 \cdot z \cdot z} = \frac{x^2}{z^2}$

3. $\frac{20m^3n^2}{65mn} = \frac{2 \cdot 2 \cdot 2 \cdot 5 \cdot m \cdot m \cdot m \cdot n \cdot n}{5 \cdot 13 \cdot m \cdot n} = \frac{2 \cdot 2 \cdot 1 \cdot 1 \cdot m \cdot m \cdot 1 \cdot n}{1 \cdot 13 \cdot 1 \cdot 1} = \frac{4m^2n}{13}$

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

- Class work: Page 198; 1-11 odd
- Homework: Page 199; 12-36 even
- Read and take notes on pages 203-205
 - > Make sure to include examples on your notes

- Tuesday, November 15, 2011
- SW multiply and divide monomials
- SW complete review quiz upon entering the classroom
- CW review notes students took multiplying and dividing monomials and work through examples together in class.
- SW complete class work, working with a partner
- SW begin homework if time permits

- Monomial: working with numbers or variables
 - Key Concept: Multiplying Monomials
They must have the same base
1) Write down the base
2) You add the exponents
 - Key Concept: Dividing Monomials
They must have the same base
1) Write the base
2) Subtract exponents
- Base: number or variable with an exponent attached

- Multiply and Divide Powers: Find each product or quotient. Express using exponents.
- $5^2 \cdot 5^3 = 5^{2+3} = 5^5$
 - $\frac{3^9}{3^7} = 3^{9-7} = 3^2$
 - $2^4 \cdot 2^6 = 2^{4+6} = 2^{10}$
 - $\frac{b^7}{b^6} = b^{7-6} = b^1$ or b
 - $\frac{8^{11}}{8} = 8^{11-1} = 8^{10}$
- Any number or variable with no exponent is to the power of 1
- Any # or variable to the power of 0 equals 1
 $8^0 = 1$ $a^0 = 1$
 $7^0 = 1$

- Multiplying/Dividing Monomials: Find each product or quotient.
- $y^6 \cdot y^3 = y^{6+3} = y^9$
 - $\frac{x^{11}}{x} = x^{11-1} = x^{10}$
 - $(5a^2)(-3a^4) = 5(-3) = -15a^{2+4} = -15a^6$
 - $(10x^2)(4x^6) = 10(4) = 40x^{2+6} = 40x^8$
 - $\frac{(-x)^5}{(-x)^4} = (-x)^{5-4} = (-x)^1$ or $(-x)$

- Class work: Page 205; 1-10 all
- Homework: Page 206; 11-32 every third, 38-42 even, 46, 48
- Read and take notes on pages 209-210

- Wednesday, November 16, 2011
 - SW write and evaluate expressions using negative exponents
 - SW complete review quiz upon entering the classroom
 - CW review notes students took negative exponents and work through examples together in class.
 - SW complete class work, working with a partner
 - SW begin homework if time permits
- Mult / Divide Monomials
 - They have to have the same base
 1) Write down the base
 2) Mult - Add Exponents Division - Subtract Exponents

- Key Concept: Negative Exponents
 - Change into fraction to make it positive
 - 1) Put the base as the denominator
 - 2) Put the number 1 in for the numerator
 - 3) Put exponent next to the base, but make it positive
- Rewrite expressions using positive exponents.
 1. $6^{-2} = \frac{1}{6^2}$
 2. $3^{-5} = \frac{1}{3^5}$
 3. $y^{-3} = \frac{1}{y^3}$
 4. $m^{-2} = \frac{1}{m^2}$

- Rewrite expressions using negative exponents.
 - 1) Find prime factorization of denominator
 - 2) Write denominator using exponents
 - 3) Write the base as an integer
 - 4) Write the exponent as a negative

1. $\frac{1}{25} = \frac{1}{5 \cdot 5} = \frac{1}{5^2} = 5^{-2}$
2. $\frac{1}{1,000,000} = \frac{1}{10 \cdot 10 \cdot 10 \cdot 10 \cdot 10} = \frac{1}{10^6} = 10^{-6}$
3. $\frac{1}{125} = \frac{1}{5 \cdot 5 \cdot 5} = \frac{1}{5^3} = 5^{-3}$
4. $\frac{1}{16} = \frac{1}{4 \cdot 4} = \frac{1}{4^2} = 4^{-2}$
 $\frac{1}{16} = \frac{1}{2 \cdot 2 \cdot 2 \cdot 2} = \frac{1}{2^4} = 2^{-4}$

- Algebraic expressions with negative exponents.
 - > Evaluate: Solve; there are no exponents
 - 1) Rewrite the problem
 - 2) Convert to a fraction
 - 3) Multiply

1. x^{-4} , if $x=3$
 $3^{-4} = \frac{1}{3^4} = \frac{1}{3 \cdot 3 \cdot 3 \cdot 3} = \frac{1}{81}$
2. w^{-3} , if $w=-3$
 $-3^{-3} = \frac{1}{-3^3} = \frac{1}{-3(-3)(-3)} = -\frac{1}{27}$
3. 8^{-2} , if $w=-3$
 $8^{-2} = \frac{1}{8^2} = \frac{1}{8 \cdot 8} = \frac{1}{64}$
4. 4^{-3} , if $x=3$
 $4^{-3} = \frac{1}{4^3} = \frac{1}{4 \cdot 4 \cdot 4} = \frac{1}{64}$

- Class work: Page 211; 1-13 all
- Homework: Page 211; 14-23 every third, 26-34 even, 38, 40

- Thursday, November 17, 2011
- SW review key concepts of simplifying algebraic fractions, multiplying/dividing monomials, and negative exponents
- SW complete review quiz upon entering the classroom
- CW review key concepts from this weeks notes
- SW complete class work, working with a partner
- SW begin homework if time permits

- Simplifying Algebraic Fractions
 - 1) Find the primes of the numerator & denominator
 - Use factor tree to find primes
 - 2) Cross out common primes & replace them with 1
 - 3) Multiply what is left

$$\frac{14x^2y}{21xy^2z} = \frac{2 \cdot \cancel{7} \cdot \cancel{x} \cdot x \cdot y}{3 \cdot \cancel{7} \cdot \cancel{x} \cdot y \cdot y \cdot z} = \frac{2x}{3yz}$$

● Multiplying/Dividing Monomials
They must have the same base

Mult.
1) Write the base
2) Add exponents

$$3^3 \cdot 3^8 = 3^{3+8} = 3^{11}$$

$$r^4 \cdot r^2 = r^{4+2} = r^6$$

$$3r^3 \cdot (4r^2) = 12r^{3+2} = 12r^5$$

Divide
1) Write the base
2) Subtract Exponents

$$\frac{4^{11}}{4^3} = 4^{11-3} = 4^8$$

$$a^8 \div a^3 = a^5$$

$$\frac{a^6 \cdot a^4}{a^{6+4}} = \frac{a^{10}}{a^{10}} = a^0 = 1$$

● Negative Exponents

Convert from Neg. to Pos.
 x^{-4}

- 1) Put base as denominator
- 2) Put a 1 for the numerator
- 3) Make exp. positive and write it by the base

$$\frac{1}{x^4}$$

Convert Pos. to Neg.
 $\frac{1}{81}$

- 1) Find equal multiples of the denominator
- 2) Write denominator using exponents
- 3) Write base as an integer
- 4) Write exponent next to the base as a neg.

$$3 \cdot 3 \cdot 3 \cdot 3 = 3^4 = 81$$

$$\frac{1}{81} = \frac{1}{3^4} = 3^{-4}$$

$$\frac{1}{9 \cdot 9} = \frac{1}{9^2} = 9^{-2}$$

● Class work: Page 221-222; 38-56 even

● Homework: Page 769; L4-4; 2-23 every third/L4-5; 2-14 every third/L4-6; 2-26 every third

● Read and take notes on pages 214-216

t-cycles = 30 min

2^t
1000 bacteria

$2^2 \times 1000$
 $4 \times 1000 = 4000$

● Friday, November 18, 2011

- SW review various items for CRT's
- SW complete vocabulary quiz upon entering the classroom
- SW complete odd numbered questions with a partner and class will review whole group
- SW complete even numbered problems for homework.