

## 5.8: Fractional Coefficients

Objective: To solve equations having fractional coefficients

1) Take out HW to be checked

- HW problems you would like done out?

2) Practice Problems

Ch 5- Objective: Review for Test

*HW: Chapter Test p. 257*

*#1-4, 7\*, 8\*(\*Factor and Simplify only) 9, 10, 16*

## Review: Ch 5 - Rational Expressions

**5.1:** To simplify quotients Using Laws of Exponents

**5.2:** To simplify Expressions Involving the Exponent Zero and Negative Exponents

**5.4:** To Simplify Rational Algebraic Expressions

**5.5:** To Multiply and Divide Rational Expressions

**5.6:** To Add and Subtract Rational Expressions

**5.8:** To solve equations having fractional coefficients

***HW: Chapter Test p. 257***

***#1-4, 7\*, 8\*(\*Factor and Simplify only) 9, 10, 16***

## EXPONENT RULES &amp; PRACTICE

**QUOTIENT RULE:** To divide when two bases are the same, write the base and SUBTRACT the exponents.

$$\frac{x^m}{x^n} = x^{m-n}$$

Examples:

A.  $\frac{x^5}{x^2} = x^3$

B.  $\frac{3^5}{3^3} = 3^2$

C.  $\frac{x^2y^5}{xy^3} = xy^2$

**ZERO EXPONENT RULE:** Any base (except 0) raised to the zero power is equal to one.

$$x^0 = 1$$

Examples:

A.  $y^0 = 1$

B.  $6^0 = 1$

C.  $(7a^3b^{-1})^0 = 1$

**NEGATIVE EXPONENTS:** If a factor in the numerator or denominator is moved across the fraction bar, the sign of the exponent is changed.

$$x^{-m} = \frac{1}{x^m} \quad \frac{1}{x^{-m}} = x^m \quad \left(\frac{x}{y}\right)^{-n} = \left(\frac{y}{x}\right)^n$$

Examples:

A.  $x^{-3} = \frac{1}{x^3}$

B.  $4^{-2} = \frac{1}{4^2} = \frac{1}{16}$

C.  $-4x^5y^{-2} = \frac{-4x^5}{y^2}$

D.  $\left(\frac{x^2}{y}\right)^{-3} = \left(\frac{y}{x^2}\right)^3 = \frac{y^3}{x^6}$

E.  $(3x^{-2}y)(-2xy^{-3}) = -6x^{-1}y^{-2} = \frac{-6}{xy^2}$

F.  $\frac{a^{-2}b^3}{c^{-4}d^{-1}} = \frac{b^3c^4d}{a^2}$

G.  $(-2x^2y^{-4})^{-2} = \left(\frac{-2x^2}{y^4}\right)^{-2} = \left(\frac{y^4}{-2x^2}\right)^2 = \frac{y^8}{4x^4}$

7.  $8^0$

8.  $-(9x)^0$

11.  $\frac{6x^7}{2x^4}$

15.  $\frac{x^5y^6}{xy^2}$

20.  $7^{-2}$

21.  $\frac{1}{x^{-5}}$

25.  $x^9 \cdot x^{-7}$

33.  $(2x^3y^{-3})^{-2}$

18.  $\left(\frac{5x^3y}{20xy^5}\right)^4$

34.  $\frac{2x^4y^{-4}}{8x^7y^3}$

38.  $\left(\frac{-2a^3b^2c^0}{3a^2b^3c^7}\right)^{-2}$

## Sample Problems

1. Simplify each of the following.

a)  $\frac{2a - 5}{5 - 2a}$

b)  $\frac{x^3 - x}{x + 1}$

c)  $\frac{2x + 1}{4x^2 - 1}$

e)  $\frac{(x + 5) - 2}{5(x + 2) - (x - 2)}$

2. Perform the indicated operations and simplify.

a)  $\frac{c}{5a} \cdot \frac{15a^2b}{3b^2c}$

b)  $\frac{5x - 30}{x^2 - 36} \cdot \frac{3x + 18}{5}$

c)  $\frac{x^2 - 3x}{x^2 - 8x + 15} \cdot \frac{x^2 - 16x + 15}{x^2 - x}$

d)  $\frac{x^2 - 9}{x^2 - 4x - 21} \div \frac{4x - 12}{3x - 21}$

3. Perform the indicated operations and simplify.

a)  $\frac{3x}{x-2} - \frac{x+4}{x-2}$

b)  $\frac{10}{x-y} - \frac{5}{y-x}$

c)  $\frac{1}{x-y} - \frac{1}{x+y}$

d)  $\frac{2}{p-5} - \frac{p+11}{p^2-2p-15}$

Solve each of the following:

(#12, 13, 17, 18 - From textbook p. 245)

1. 
$$\frac{2a-3}{6} = \frac{2a}{3} + \frac{1}{2}$$

2. 
$$\frac{2b-3}{7} - \frac{b}{2} = \frac{b+3}{14}$$

12) 
$$\frac{v^2}{6} - \frac{1}{8} = \frac{v}{3}$$

13) 
$$\frac{x^2}{9} - \frac{x-1}{10} = 0$$

17) 
$$\frac{x(x+1)}{5} - \frac{x+1}{6} = \frac{1}{3}$$

18) 
$$\frac{2t(3t-1)}{5} - \frac{t+1}{2} = \frac{1}{10}$$