

# Unit 12 - Packet 1

## Notes, Class Work & Homework

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- Undefined Fractions
- Multiplying and Dividing Fractions
- Adding and Subtracting Fractions with Like Denominators
- Adding and Subtracting Fractions with Unlike Denominators
- Fractional Equations
- Word Problems Involving Fractions

Name \_\_\_\_\_

Class \_\_\_\_\_

Date \_\_\_\_\_

**Integrated Regents Algebra AIS Assignments**  
**Unit 12 Rational Expressions/Equations**

*BDF 80 Minute Classes*

Label All Assignments with your name and HW number!!!

Homework:

2/14	New Unit 12: Undefined and simplify Expressions		#32	pgs 4-6 EVENS
2/15	CW: pgs 7-8		#33	Finish Classwork
2/16	Multiplication/Division of rational Expressions		#34	Practice: 9a, 9b EVENS
2/17	Rev. unit to date: pgs/10-11		#35	Finish Classwork
2/18	No Class: E day			
2/28	Addition/Subtraction Rational Expressions		#36	Like denominators: pgs. 14-15
	Quiz # 1			
3/1	Add/Subtract with Unlike Denominators		#37	Finish CW: pgs. 18-19
3/2	Review Add/Subtract unlike Den.'s		#38	Practice B pg. 22
3/3	Solving Fractional Equations		#39	Pgs. 25-26 Evens
3/4	Review Fract. Equations		#40	Pg 25-26 Odds
3/7	No Class: E Day			
3/8	Fractional Word Problems Quiz # 2		#41	Solv. Fract. Word Prob's: pg 29
3/9	Review Word Problems		# 42	Begin Unit review Separate Packet
3/10	Begin Unit review Quiz # 3		# 43	Unit Review
3/11	Unit 12 review		#44	Finish review
3/14	Unit Review			
3/15	No Class: E day			Regents review # 4
3/16	Unit 12 Test			Reg's rev Due next class!

ALGEBRAIC FRACTIONS:

- **Definition:** An algebraic fraction is the quotient of polynomials.
- **Example:**  $\frac{3x+12}{x^2-16}$

UNDEFINED OR MEANINGLESS FRACTIONS:

- **Definition:** A fraction  $\frac{a}{b}$  means that some number represented by "a" (the numerator) is to be divided by "b" (the denominator). Since division by zero is not possible the value of the denominator may not be zero. An algebraic fraction is defined or has meaning only for those values of the variable for which the denominator is not zero.
- **Examples:** Find the value of the variable for which the fraction is undefined.

1.)  $\frac{3}{x}$

2.)  $\frac{12}{x^2}$

3.)  $\frac{7x}{x+2}$

4.)  $\frac{3x-1}{5-x}$

5.)  $\frac{2x}{4x-1}$

6.)  $\frac{11x}{25-x^2}$

7.)  $\frac{4}{x^2-6x+9}$

8.)  $\frac{8m}{m^2+4m-12}$

Reducing Algebraic Fractions to Lowest Terms

**A. Procedure:**

- 1.) Factor all polynomials completely. If a polynomial cannot be factored put it in parentheses
- 2.) Cancel any common factors between numerator and denominator.  
(The only way a polynomial can be canceled is to have identical polynomials in both numerator and denominator or polynomials, which are additive inverses. *You cannot cancel parts of polynomials.*)

**B. Examples: Reduce the following fractions into lowest terms.**

1.)  $\frac{-18x^5y^4}{4x^7y^4}$

2.)  $\frac{x^2 + 5x}{4x + 20}$

3.)  $\frac{x^2 - 9}{x^2 - 2x - 15}$

4.)  $\frac{3x^2 - 48}{2x^2 + 16x + 32}$



$$5.) \frac{2x^2 - 13x + 6}{(x-6)^2}$$

$$6.) \frac{x-7}{7-x}$$

$$7.) \frac{4-x^2}{x^2+2x-8}$$

Regents Algebra: Undefined Fractions  
Homework

Name \_\_\_\_\_

Date \_\_\_\_\_

Directions: Find the value(s) of the variable for which the fraction is undefined.

1.)  $\frac{9}{x}$

2.)  $\frac{3}{2m}$

3.)  $\frac{2x}{x+7}$

4.)  $\frac{3}{5-x}$

5.)  $\frac{7}{-6+y}$

6.)  $\frac{5c}{2c-3}$

7.)  $\frac{12y}{4+3y}$

8.)  $\frac{2m}{m^2-1}$

9.)  $\frac{15}{n^2-25}$

10.)  $\frac{n-2}{16-n^2}$

11.)  $\frac{8a}{a^2+7a+10}$

12.)  $\frac{6}{x^2-x-12}$

~~1.)  $\frac{m+3}{3m^2+7m+2}$~~

~~1.)  $\frac{3k-1}{2k^2-k-3}$~~

Algebra Regents: Reducing Fractions  
Assignment #1

Name \_\_\_\_\_

Date \_\_\_\_\_

**Directions:** Simplify each of the following & show all of your work. (F.Y.I. Some cannot be simplified)

1.)  $\frac{4m-20}{8m}$

.....

2.)  $\frac{7x-28}{x^2+3x-28}$

.....

3.)  $\frac{a^2-b^2}{a^2+2ab+b^2}$

.....

4.)  $\frac{4-x^2}{x^2-x-2}$

.....

5.)  $\frac{5-x}{x^2-8x+15}$

.....

~~9.)~~  $\frac{2x^2+11x-6}{x+6}$

$$7.) \frac{x^2 + 25}{2x + 10}$$

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$$8.) \frac{a^2 - b^2}{(a + b)^2}$$

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$$9.) \frac{3 - k}{k^2 - 2k - 3}$$

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$$10.) \frac{h^2 + h - 12}{h^2 + 5h + 4}$$

---

$$11.) \frac{3x^2 - 12x - 15}{3x^2 - 18x + 15}$$

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$$12.) \frac{5z^3 - 125z}{10z^2 - 250}$$

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$$13.) \frac{f + g}{3(f + g)^3}$$

Regents Algebra: Assignment  
Undefined / Reducing  
Algebraic Fractions

Name \_\_\_\_\_

Date \_\_\_\_\_

**Directions:** Determine the value or values that would make the fraction undefined.

1.)  $\frac{3}{6x}$

2.)  $\frac{7-x}{x}$

3.)  $\frac{3x-5}{2x+7}$

4.)  $\frac{x^2+3x-18}{5+x}$

5.)  $\frac{2x-3}{x^2}$

6.)  $\frac{7x-8}{x^2-1}$

7.)  $\frac{x}{x^2+3x+2}$

~~8.)~~  $\frac{2x^2-x-28}{3x^2+11x+6}$

**II. Directions:** Reduce each rational expression to lowest terms.

9.)  $\frac{3x+9}{x^2-9}$

.....

10.)  $\frac{4x^2+8x}{12x+24}$

.....

11.)  $\frac{x^2-2x}{3x-6}$

.....

12.)  $\frac{15x^2+24x}{3x^2}$

$$13.) \frac{y^2 - 25}{2y^2 - 8y - 10}$$

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$$\cancel{14.)} \frac{3y^2 - y - 2}{3y^2 + 5y + 2}$$

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$$15.) \frac{x^2 + 4x - 5}{x^2 - 2x + 1}$$

---

$$16.) \frac{x - x^2}{x^2 + x - 2}$$

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$$17.) \frac{x^2 + x - 6}{9 - x^2}$$

---

$$\cancel{18.)} \frac{2x^2 + 5x - 3}{1 - 2x}$$

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$$19.) \frac{24x^2}{12x^2 - 6x}$$

---

$$\cancel{20.)} \frac{2x^3 - x^2 - 10x}{x^3 - 2x^2 - 8x}$$

---

**Regents Algebra: Notes**  
**Multiplication and Division of**  
**Algebraic Fractions**

Name \_\_\_\_\_

Date \_\_\_\_\_

**Procedure:**

- If possible, factor any polynomials which are numerators or denominators of the fractions.
  - Greatest Common Factor ( GCF )
  - Different of Two perfect Squares ( DOTS )
  - Quadratic Trinomial ( QT )
  - Remember to factor completely
- Change division to multiplying by the reciprocal.
- Divide both a numerator and denominator by any common factors.
- Multiply numerators.
- Multiply denominators.

**Exercises:** Multiply or divide as indicated.

1.)  $\frac{12x}{5y} \cdot \frac{15y^2}{36x^2}$

2.)  $\frac{16c^3}{21d^2} \div \frac{24c^4}{14d^3}$

3.)  $\frac{7}{x^2 - 4} \cdot \frac{2x + 4}{21}$

4.)  $\frac{8x^2}{x^2 - 25} \div \frac{4x}{3x + 15}$

5.)  $\frac{a^2 - 2a - 15}{2a - 10} \cdot \frac{8}{a^2 + 6a + 9}$

P.1. A.A.18: Multiply and divide algebraic fractions and express the product or quotient in simplest form

Multiply:

1.  $\frac{x^2}{x+2} \cdot \frac{x^2-5x-14}{x^2+2x}$

[A]  $x$  [B]  $\frac{-5x-14}{4x}$

[C]  $\frac{x^2-7x}{x+2}$  [D]  $\frac{x^2+7x}{x+2}$

2.  $\frac{x^2}{x+5} \cdot \frac{x^2-x-30}{x^2-6x}$

[A]  $\frac{x^2+6x}{x-6}$  [B]  $\frac{-x-30}{-30x}$

[C]  $x$  [D]  $\frac{x^2-6x}{x-6}$

3.  $\frac{x^2}{x+9} \cdot \frac{x^2+6x-27}{x^2-3x}$

[A]  $x$  [B]  $\frac{6x-27}{-27x}$

[C]  $\frac{x^2-3x}{x-3}$  [D]  $\frac{x^2+3x}{x-3}$

4. What is the product of  $\frac{x^2-x-6}{x^2-3x+2} \cdot \frac{2x^2-6x+4}{x^2-2x-3}$ ?

[A]  $\frac{2x+4}{x+1}$  [B]  $\frac{x+2}{x+1}$

[C]  $6$  [D]  $\frac{2x+4}{x-1}$

Multiply:

5.  $\frac{x^2}{x+8} \cdot \frac{x^2+x-56}{x^2-7x}$

6.  $\frac{x^2}{x+4} \cdot \frac{x^2-2x-24}{x^2-6x}$

7.  $\frac{x^2}{x-9} \cdot \frac{x^2-4x-45}{x^2-4x}$

8.  $\frac{x^2}{x+3} \cdot \frac{x^2+5x+6}{x^2+2x}$

9. Compare the quantities in Column A and Column B.

<u>Column A</u>	<u>Column B</u>
$\frac{-3x-6}{x+2}$	$-6x \cdot \frac{3x}{6x^2}$

[A] The quantity in Column A is greater.

[B] The quantity in Column B is greater.

[C] The quantities are equal.

[D] The relationship cannot be determined from the information given.

10. Explain why the simplified form of

$$\frac{x-8}{4} \cdot \frac{3}{8-x} \text{ is } -\frac{3}{4}.$$

P.I. A.A.18: Divide algebraic fractions and express the quotient in simplest form

Divide:

$$1. \frac{x^2 + 11x + 28}{x^2 - 16} \div \frac{x+7}{x-7}$$

$$[A] \frac{x-7}{x-4}$$

$$[B] \frac{x-9}{x-4}$$

$$[C] \frac{x+4}{x-7}$$

$$[D] \frac{11x+7}{4}$$

$$2. \frac{x^2 + 9x + 20}{x^2 - 25} \div \frac{x+4}{x-4}$$

$$[A] \frac{x+5}{x-4}$$

$$[B] \frac{9x+4}{5}$$

$$[C] \frac{x-9}{x-5}$$

$$[D] \frac{x-4}{x-5}$$

$$3. \frac{x^2 - 1}{x+5} \div (x+1)$$

$$[A] \frac{x-1}{x+5}$$

$$[B] \frac{x+5}{x-1}$$

$$[C] \frac{(x+1)(x-1)}{x+5}$$

$$[D] \frac{x+1}{x+5}$$

$$4. \frac{x^2 - 64}{x-4} \div (x+8)$$

$$[A] \frac{x+8}{x-4}$$

$$[B] \frac{(x+8)(x-8)}{x-4}$$

$$[C] \frac{x-4}{x-8}$$

$$[D] \frac{x-8}{x-4}$$

$$5. \frac{x+1}{x-1} \div \frac{x^2-1}{1-x}$$

$$[A] \frac{x+1}{x-1}$$

$$[B] \frac{1}{x-1}$$

$$[C] \frac{1}{1-x}$$

$$[D] \frac{1}{3-x}$$

$$6. \text{ What is the quotient } \frac{y-5}{20} \div \frac{5-y}{25} ?$$

$$[A] -0.002$$

$$[B] -0.8$$

$$[C] 1.25$$

$$[D] -1.25$$

$$[E] 0.8$$

Divide:

$$7. \frac{x^2 - 81}{x+3} \div (x-9)$$

$$8. \frac{x+2}{x-2} \div \frac{x^2-4}{2-x}$$

$$9. \frac{x+5}{x-5} \div \frac{x^2-25}{5-x}$$

$$10. \text{ Find two rational expressions that can be divided to give the quotient } \frac{x-3}{x+1}.$$

Regents Algebra: Assignment  
Undefined, Simplifying, Multiplying  
& Dividing Algebraic Fractions

Name \_\_\_\_\_

Date \_\_\_\_\_

I. Directions: Find the value of the variable for which the fraction is undefined.

1.)  $\frac{2}{x}$

2.)  $\frac{-3}{7x}$

3.)  $\frac{y}{y-9}$

4.)  $\frac{x+3}{x+5}$

5.)  $\frac{t}{5-t}$

6.)  $\frac{w}{2w+3}$

7.)  $\frac{18}{w^2}$

8.)  $\frac{y+16}{y^2-16}$

9.)  $\frac{x+3}{x^2-2x-8}$

10.)  $\frac{3-x}{x^2-x-6}$

II. Directions: Reduce to lowest terms.

11.)  $\frac{ay}{by}$

12.)  $\frac{3x^2}{12x^5}$

13.)  $\frac{8x^3y^2}{12x^2y^4}$

14.)  $\frac{5x}{5x-35}$

15.)  $\frac{ab+ac}{db+dc}$

16.)  $\frac{x-3}{3-x}$

17.)  $\frac{9a-18}{8-4a}$

18.)  $\frac{x^2-3x}{x^2-4x+3}$

19.)  $\frac{a^2-a-6}{a^2-9}$

$$20.) \frac{25-x^2}{x^2-x-20}$$

$$21.) \frac{6a-9}{2a^2-7a+6}$$

III. Directions: Perform the indicated operation. Express the answer in simplest form.

$$22.) \frac{24x}{35y} \cdot \frac{14y}{8x}$$

$$23.) \frac{9xy^2}{10cd} \div \frac{18y^3}{5c^2d^3}$$

$$24.) \frac{5x+5y}{x^2y} \cdot \frac{xy^2}{y^2-x^2}$$

$$25.) \frac{x^2-36}{7y^3} \div \frac{6-x}{14y^4}$$

$$26.) \frac{y^2-2y-8}{4x^2y+8x^2} \cdot \frac{8x^2}{8-2y}$$

$$27.) \frac{x^2-8x+15}{x^2-9} \div \frac{x^2+6x+5}{x^2+4x+3}$$

Adding and Subtracting Algebraic Fractions with Like Denominators

A. Procedure:

- ◆ If the operation is subtraction, change the subtraction sign to an addition sign and change the signs of all the terms in the numerator of the fraction that follows.
- ◆ Combine the like terms in the numerator and write the new numerator over the common denominator.
- ◆ Reduce the answer to its lowest terms. (Remember to factor any polynomials before you reduce).

B. Examples: Perform the indicated operation and express the answer in lowest terms.

#1.)  $\frac{7x}{12} + \frac{5x}{12}$

#2.)  $\frac{11m}{5} - \frac{8m}{5}$

#3.)  $\frac{y+7}{4y} + \frac{y-2}{4y}$

#4.)  $\frac{x}{3m} - \frac{y}{3m} - \frac{z}{3m}$

#5.)  $\frac{4x^2-13}{3x+9} + \frac{4-3x^2}{3x+9}$

$$\#6.) \frac{5x^2 + 3x}{4x + 8} - \frac{4x^2 - 5x - 12}{4x + 8}$$

$$\#7.) \frac{x}{x^2 - 5x - 24} - \frac{8}{x^2 - 5x - 24}$$

**Adding or Subtracting Two Fractions Whose Denominators are Additive Inverses (opposites)**

**C.) Procedure:**

- ✦ Switch the terms of one denominator to match those in the other fraction
- ✦ Change the sign(s) in the numerator of that fraction to their opposites.

**D.) Examples:** Perform the indicated operation and express the answer in lowest terms.

$$\#8.) \frac{2x}{x-3} + \frac{6}{3-x}$$

$$\#9.) \frac{7}{3x-6} - \frac{2}{6-3x}$$

Regents Algebra: + and -  
of Algebraic Fractions with  
Like Denominators HW

Name \_\_\_\_\_

Date \_\_\_\_\_

**Directions:** Perform the indicated operation and express the answer in simplest form.

#1.)  $\frac{7x}{3} + \frac{2x}{3}$

#2.)  $\frac{9y}{5} + \frac{7y}{5} - \frac{4y}{5}$

#3.)  $\frac{a+2}{4} - \frac{a-6}{4}$

#4.)  $\frac{r}{7x} - \frac{s}{7x} + \frac{t}{7x}$

#5.)  $\frac{a}{a+b} + \frac{b}{b+a}$

#6.)  $\frac{a}{a^2 - b^2} - \frac{b}{a^2 - b^2}$

#7.)  $\frac{9}{x-y} + \frac{7}{y-x}$

#8.)  $\frac{a}{a-b} + \frac{b}{b-a}$

#9.)  $\frac{6x}{2x-3} + \frac{9}{3-2x}$

#10.)  $\frac{7R+8}{R^2-9} + \frac{4R+17}{9-R^2}$

$$\#11.) \frac{b^2 + 4b}{3b + 6} + \frac{2 - b}{3b + 6}$$

$$\#12.) \frac{x^2 + 7x - 10}{x^2 + 6x + 8} - \frac{x^2 + 2x - 20}{x^2 + 6x + 8}$$

$$\#13.) \frac{2x^2 - 7}{x - 2} - \frac{x^2 - 3}{x - 2}$$

$$\#14.) \frac{9b + 1}{2b} + \frac{b - 1}{2b}$$

$$\#15.) \frac{x}{x^2 - 2x - 3} - \frac{3}{x^2 - 2x - 3}$$

$$\#16.) \frac{5x}{x + 4} + \frac{20}{4 + x}$$

$$\#17.) \frac{x}{x^2 + 3x - 18} + \frac{6}{x^2 + 3x - 18}$$

$$\#18.) \frac{4d + 2}{3d} + \frac{2d + 1}{3d}$$

$$\#19.) \frac{5a}{12} - \frac{a}{12}$$

$$\#20.) \frac{17}{8y^2} - \frac{9}{8y^2} + \frac{5}{8y^2}$$

Adding and Subtracting Algebraic Fractions with Unlike Denominators

Procedure:

- If the operation is subtraction, change the subtraction sign to addition and change all of the signs in the numerator of the second fraction.
- Find the least common denominator for all fractions. This is the product of the different monomial and polynomial factors that exist in the denominator of the fractions:
  - The LCD for the numerical coefficients is the smallest multiple for each of the numbers.
  - The LCD for the variables is the largest exponent of each of the common variables.
- Rewrite each fraction with the least common denominator:
  - To determine the new numerator for the first fraction compare the denominator of the first fraction to the LCD and multiply the numerator by the terms that are missing. Use the same procedure to determine the new numerator of the second fraction.
- Combine the like terms in the numerator and write the expression over the common denominator.
- Express the final answer in lowest terms.

Examples: Perform the indicated operation and express the answer in lowest terms.

#1.)  $\frac{3x}{8} + \frac{x}{6}$

#2.)  $\frac{x}{ac} + \frac{y}{ab} - \frac{z}{bc}$

$$3.) \frac{6}{x} + \frac{3}{x^3}$$

$$\#4.) \frac{x}{5m^3} - \frac{2x}{4m^2}$$

$$\#5.) \frac{2x-3}{4} - \frac{4x+5}{6}$$

$$\#6.) \frac{m+1}{3m} + \frac{m+4}{4m}$$

Regents Algebra: + and -  
of Algebraic Fractions with  
Unlike Denominators HW #1

Name \_\_\_\_\_

Date \_\_\_\_\_

**Directions:** Perform the indicated operation and express the answer in simplest form.

#1.)  $\frac{5x}{4} + \frac{x}{4} + \frac{3x}{4}$

#2.)  $\frac{11R}{6} - \frac{R}{6} - \frac{7R}{6}$

#3.)  $\frac{9}{8x} + \frac{3}{8x} - \frac{2}{8x}$

#4.)  $\frac{a}{5y} + \frac{b}{5y} + \frac{c}{5y}$

#5.)  $\frac{x}{x+1} + \frac{1}{x+1}$

#6.)  $\frac{a}{a^2 - b^2} - \frac{b}{a^2 - b^2}$

#7.)  $\frac{3}{x-4} + \frac{1}{4-x}$

#8.)  $\frac{x}{x-3} + \frac{3}{3-x}$

#9.)  $\frac{4x}{2x-5} + \frac{10}{5-2x}$

#10.)  $\frac{5a}{a^2 - b^2} - \frac{5b}{a^2 - b^2}$

$$\#11.) \frac{6r-5}{r^2-1} - \frac{5r-6}{r^2-1}$$

$$\#12.) \frac{3x^2-1+5x}{x^2-4x+3} - \frac{8+2x^2+5x}{x^2-4x+3}$$

$$\#13.) \frac{9x}{4} + \frac{x}{2} + \frac{3x}{8}$$

$$\#14.) \frac{7}{4y} - \frac{2}{6y} - \frac{1}{9y}$$

$$\#15.) \frac{5}{x} - \frac{6}{y}$$

$$\#16.) \frac{n}{s} - \frac{m}{t}$$

$$\#17.) \frac{3}{y^2} - \frac{2}{y^3}$$

$$\#18.) \frac{x-2}{4x} + \frac{2x-3}{3x}$$

$$\#19.) \frac{2a+1}{5a} - \frac{4a-2}{4a}$$

$$\#20.) \frac{r+x}{r^2x} - \frac{r-2x}{rx^2}$$

**Directions:** Perform the indicated operation and express the answer in lowest terms.

#1.)  $\frac{2b}{9t} - \frac{3-7b}{9t}$

#2.)  $\frac{2a}{a^2+3a-4} - \frac{a+1}{a^2+3a-4}$

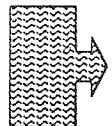
#3.)  $\frac{x^2}{x-5} + \frac{25}{5-x}$

#4.)  $\frac{9x^2}{3x-5} + \frac{25}{5-3x}$

#5.)  $\frac{2a+1}{5} - \frac{a-3}{2}$

#6.)  $\frac{1}{x} - \frac{2}{x^2} + \frac{1}{x^3}$

over



$$\#7.) \frac{1}{a} + \frac{1}{b}$$

$$\#8.) \frac{3}{x} - \frac{2}{y} + \frac{7}{z}$$

$$\#9.) \frac{2}{x^2} - \frac{3}{y^2}$$

$$\#10.) \frac{5}{3a^2b} + \frac{7}{6ab^2}$$

$$\#11.) \frac{2}{9x^3y^2} - \frac{5}{6x^2y^3}$$

**LESSON**  
**12.5**

**Practice B**

**Adding and Subtracting Rational Expressions**

Add or subtract. Simplify your answer.

1.  $\frac{3m}{8m^3} + \frac{m}{8m^3}$

\_\_\_\_\_

2.  $\frac{x^2 - 6x}{x + 3} + \frac{4x - 15}{x + 3}$

\_\_\_\_\_

3.  $\frac{c^2 + c}{c^2 - 25} - \frac{c^2 + 5}{c^2 - 25}$

\_\_\_\_\_

4.  $\frac{6a - 1}{a^2 + 7a + 10} - \frac{2a - 9}{a^2 + 7a + 10}$

\_\_\_\_\_

Find the LCM of the given expressions.

5.  $4a^2b, 6a, 10b^3$

\_\_\_\_\_

6.  $x^2 + 5x + 6, (x + 3)(x - 1)$

\_\_\_\_\_

Add or subtract. Simplify your answer.

7.  $\frac{5}{3n} - \frac{2}{2n}$

\_\_\_\_\_

8.  $\frac{y^2 + 4y}{y^2 + 6y + 8} + \frac{3}{y + 2}$

\_\_\_\_\_

9.  $\frac{x + 2}{x^2 - 9} - \frac{1}{9 - x^2}$

\_\_\_\_\_

10.  $\frac{1}{6y^2 + 24y} - \frac{3}{y^2 - y - 20}$

\_\_\_\_\_

11. Kendrick walked 1 mile, and then jogged 5 miles. His jogging speed was 4 times his walking speed  $w$  in mi/h.

a. Write and simplify an expression that represents Kendrick's total exercise time.

\_\_\_\_\_

b. How many minutes did Kendrick exercise if his walking speed was 3 mi/h?

\_\_\_\_\_

Regents Algebra: Warm-up  
Review for +/- Fractions Quiz

Name \_\_\_\_\_

Date \_\_\_\_\_

1.  $\frac{a+2}{4} - \frac{a-6}{4}$

4.  $\frac{x}{2} - \frac{x+1}{5}$

2.  $\frac{a}{a^2-b^2} - \frac{b}{a^2-b^2}$

5.  $\frac{2}{a} + \frac{1}{b}$

3.  $\frac{6x}{2x-3} + \frac{9}{3-2x}$

6.  $\frac{3}{9ab^2} + \frac{4}{2a^2b}$

Regents Algebra: Notes  
Solving Equations Containing  
Fractional Coefficients

Name \_\_\_\_\_

Date \_\_\_\_\_

I. Solving Equation Containing Fractional Coefficients:

a. Procedure:

- 1.) Write the equation expressing all terms as fractions.
- 2.) Find the Least Common Denominator (L.C.D.)
- 3.) Multiply each term of the equation by the L.C.D.
- 4.) Cancel the common factors between the L.C.D. and the denominator of each fraction.
- 5.) Solve the remaining equation.
- 6.) Check the answer in the original equation.

b. Examples: Solve and check the following equations.

1.)  $\frac{3y+1}{4} = \frac{y+13}{2}$

2.)  $\frac{x-2}{x} = \frac{2}{x+3}$

3.)  $\frac{2}{x} - \frac{x}{8} = \frac{3}{4}$

4.)  $\frac{x+2}{4} - \frac{x-3}{3} = \frac{1}{2}$

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

Regents Algebra: Assignment  
Solving Equations Containing  
Fractional Coefficients #2

Name \_\_\_\_\_

Date \_\_\_\_\_

Directions: Solve and check the following equation. Show all of your work!

1.)  $\frac{-2}{-2x-5} = \frac{4}{3x+4}$

2.)  $\frac{2x}{9} + 4 = \frac{2x}{3} + 2$

3.)  $\frac{5}{x+6} = \frac{x-6}{x}$

4.)  $\frac{c+2}{2} + \frac{c-1}{3} = 4$

5.)  $\frac{x}{9} - \frac{8}{x} = \frac{1}{9}$

6.)  $\frac{3}{4x-9} = \frac{x}{3}$

$$7.) \frac{m+1}{2} + \frac{2m-3}{3m} = 4$$

$$8.) \frac{2x}{3} - 10 = \frac{x}{4}$$

$$9.) \frac{2x}{3} - \frac{x+3}{6} = 2$$

$$10.) \frac{x+3}{x-1} = \frac{x+4}{x-5}$$

Solving Verbal Problems Involving Fractional Equations

Many verbal problems lead to fractional equations. To solve these problems follow the procedure for solving verbal problems and apply the techniques used to solve fractional equations.

Exercises: Solve each of the following problems algebraically.

#1.) One-third of a number increased by 2 is the same as one-half the number decreased by 3.  
Find the number.

#2.) The numerator of a fraction is 7 less than the denominator. If the numerator is decreased by 2 and the denominator is increased by 3, the value of the new fraction is  $\frac{1}{3}$ . Find the original fraction.

#3.) The larger of two numbers is 5 less than six times the smaller. When the larger number is divided by the smaller number, the quotient is 5 and the remainder is 2. Find the number.

#4.) When a number is decreased by twice its reciprocal, the result is  $\frac{47}{7}$ . Find the number.

Regents Algebra: Verbal Problems  
Involving Fractional Equations  
Assignment #1

Name \_\_\_\_\_

Date \_\_\_\_\_

**Directions:** On your own paper, solve each of the following problems algebraically.

#1.) If five times a number is increased by one-third of itself, the result is 32. Find the number,

.....

#2.) Find two consecutive integers such that if 7 more than the first is divided by 9 less than the second, the quotient is 6.

.....

#3.) The numerator of a fraction is 8 less than the denominator. The value of the fraction is  $\frac{4}{5}$ .  
Find the fraction.

.....

#4.) The numerator of a fraction is 5 less than the denominator. If the numerator is doubled and the denominator is increased by 7, the value of the resulting fraction is  $\frac{2}{3}$ . Find the original fraction.

.....

#5.) What number must be added to both the numerator and denominator of the fraction  $\frac{8}{15}$  to make the resulting fraction equal to  $\frac{3}{4}$ .

.....

#6.) The larger of two numbers is 3 less than seven times the smaller. If the larger number is divided by the smaller number, the quotient is 6 and the remainder is 2. Find the numbers.

.....

#7.) When the reciprocal of a number is decreased by 2, the result is 5. Find the number.

.....

#8.) A number increased by its reciprocal is equal to  $\frac{13}{6}$ . Find the number.

Regents Algebra: Assignment  
Solving Equations Containing  
Fractional Coefficients Review

Name \_\_\_\_\_

Date \_\_\_\_\_

Directions: Solve and check the following equation. Show all of your work!

1.)  $\frac{3x-6}{2-x} = \frac{3}{2}$

2.)  $\frac{x}{x+3} = \frac{8}{x+6}$

3.)  $\frac{2m}{5} - \frac{m-2}{10} = 2$

4.)  $\frac{k}{4} = \frac{10}{6} - \frac{1}{k}$