




Central High School- Everyone Connects:  
Attend, Engage, Achieve



## Algebra 2 Agenda 2/14:

 (Get out homework to turn in  
& Unit 6 notes)

- 1.) Pairs Together: **Unit 6 Lesson 1-2 Review** (25-30 min)
- 2.) Notes: **Solving Rational Equations** (35-45 min)
- 3.) **CW/HW: U6L3 Solving Rational Equations WS** (10-25 min)

**Unit 5B Test Corrections  
Questions on HW**

**Quiz Next Class!  
Lessons 1-3**

**UNIT 5A**

**RETAKE**



**BY**



**FRIDAY!**

**5B Test Corrections due by Feb 22<sup>nd</sup>!**

**Planning to retake Unit 5B TEST?**

- 1.) Retake Contract Signed
- 2.) Test Corrections
- 3.) Retake Assignment
- 4.) After school tutoring



**Retake must be completed by Tues, Feb. 26<sup>th</sup>!**



# PAIRS Together



*Alone we can do so little;  
together we can do so much. -Helen Keller*



Obj: Multiply and divide algebraic fractions.

Obj: Simplify algebraic fractions.



Obj: Add and subtract algebraic fractions

Simplify the following.

$$1. \frac{\overbrace{(x^2+5)(x+2)}^{(x+5)(x+2)}}{3x^3-12x} \cdot \frac{x+5}{3x(x-2)}$$

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

$$2. \frac{\overbrace{5x^3}^{20x^3}}{3x+12} \cdot \frac{\overbrace{(x+4)(x-4)}^{x^2-16}}{16x^2} \cdot \frac{5x^3(x-4)}{12}$$

$$\frac{3(x+4)}{4 \cdot 1}$$

$$3. \frac{3x^2+10x+3}{x^2-25} \cdot \frac{(3x+1)(x+3)}{(x+5)(x-5)} \cdot \frac{4(x+5)}{4(3x+1)}$$

$$\frac{12x+4}{4x+20}$$

$$\frac{x+3}{x-5}$$





# PAIRS Together

*Alone we can do so little;*

*together we can do so much. -Helen Keller*



Obj: Multiply and divide algebraic fractions.

Obj: Simplify algebraic fractions.

Obj: Add and subtract algebraic fractions



Simplify the following.

LCD:  $(x-4)(x+3)$

$$4. \frac{\overset{(x+3)}{\cancel{(x+3)}} \cdot \overset{(x-4)}{\cancel{(x-4)}} \cdot (x+2)}{\overset{(x+3)}{\cancel{(x+3)}} \cdot \overset{(x-4)}{\cancel{(x-4)}}} + \frac{\overset{(x-4)}{\cancel{(x-4)}} \cdot (x-2)}{\overset{(x-4)}{\cancel{(x-4)}} \cdot \overset{(x+3)}{\cancel{(x+3)}}} \cdot \frac{2x^2 - x + 14}{(x-4)(x+3)}$$

$$\frac{x^2 + 2x + 3x + 6}{(x-4)(x+3)} + \frac{x^2 - 4x - 2x + 8}{(x-4)(x+3)}$$

$$= \frac{2x^2 - x + 14}{(x-4)(x+3)}$$

$$\cancel{(2x-1)(x-14)}$$

$$\begin{array}{r} -1x \\ -28x \end{array}$$



$$\cancel{(x+4)(x-5)}$$

$$5. \frac{\overset{(x+3)}{\cancel{(x+3)}} \cdot x}{x^2 + 9x + 20} + \frac{\overset{(x+5)}{\cancel{(x+5)}} \cdot (-4)(x+5)}{x^2 + 7x + 12} \cdot \frac{(x-5)}{(x+5)(x+3)}$$

$$\overset{(x+3)}{\cancel{(x+3)}} \cdot \frac{x}{(x+5)(x+4)} + \frac{\overset{(x+5)}{\cancel{(x+5)}} \cdot (-4)(x+5)}{\overset{(x+5)}{\cancel{(x+5)}} \cdot (x+4)(x+3)} \cdot \frac{(x-5)}{\overset{(x+5)}{\cancel{(x+5)}}}$$

LCD:  $(x+5)(x+4)(x+3)$

$$\frac{x^2 + 3x}{LCD} + \frac{-4x - 20}{LCD} =$$

$$\frac{x^2 \overset{(x+4)}{\cancel{(x+4)}} \overset{(x-5)}{\cancel{(x-5)}} - x - 20}{(x+5) \overset{(x+4)}{\cancel{(x+4)}} (x+3)}$$

Recall:  $\frac{2}{3}x + 4 = \frac{3}{4}x + \frac{1}{6}$



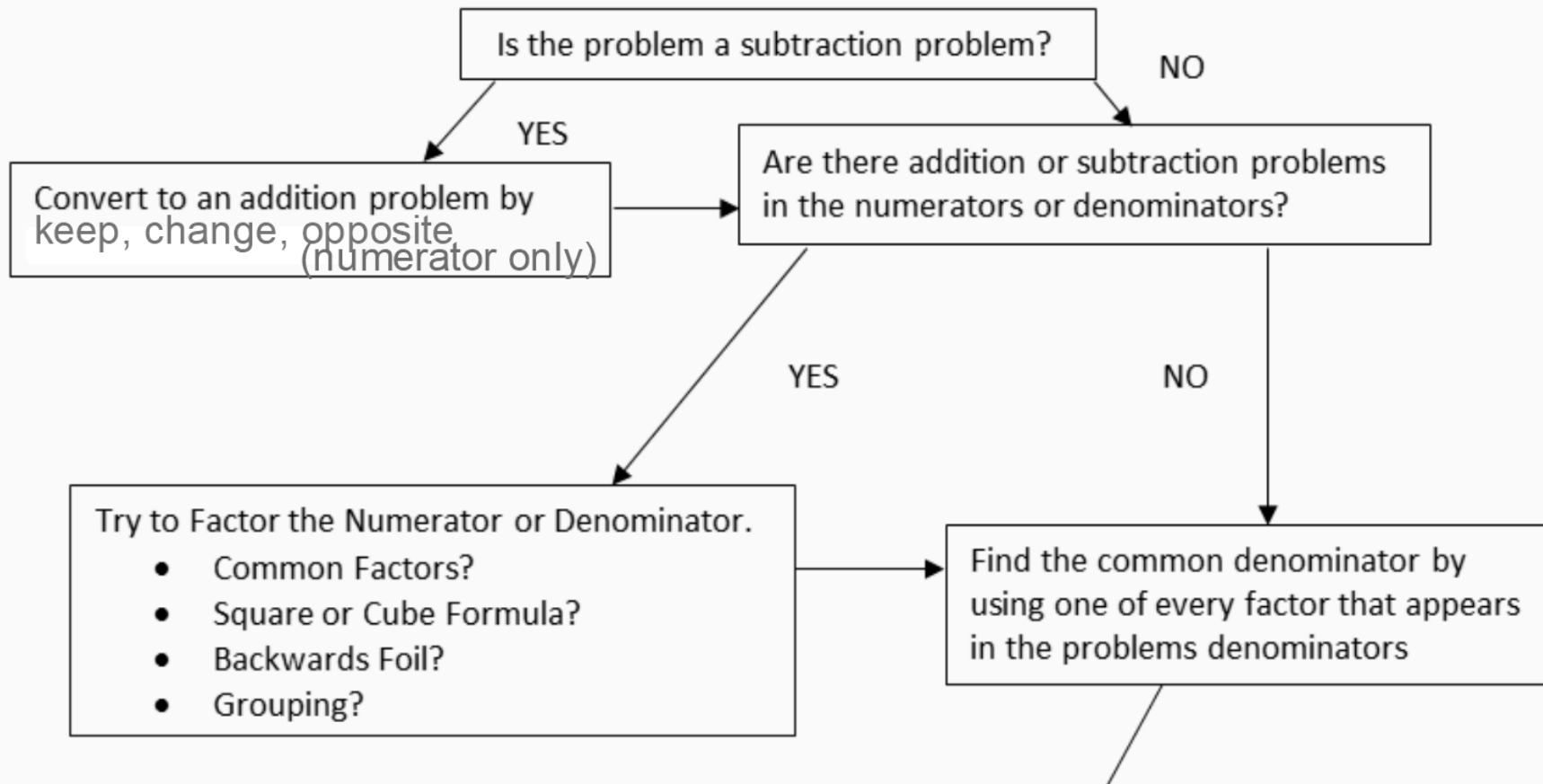
# Solving Rational Equations



Obj: Solve rational equations in one variable.

## How to solve rational (fractional) equations

(Problems that have an equal sign!)





# Solving Rational Equations



Obj: Solve rational equations in one variable.

Convert your fractions into new fractions with the common denominator by multiplying the numerator by what is missing from the denominator.



Multiply both sides by the common denominator so that you can cancel and eliminate the fractions



Solve the equation that you have!

- If there is no exponent on the variable solve to get the answer.
- If there is a square in your equation you will have to get everything to one side, factor and then solve. Or use the quadratic equation if it won't factor.

Check your answers for extraneous solutions (answers that are bad)



# Solving Rational Equations



Obj: Solve rational equations in one variable.

$$y \neq 0$$

**Solve. Check your solutions.** (make sure answer doesn't give you a zero in the denominator)

$$\text{LCD: } 2 \cdot 3 = 6$$

$$1) \frac{3 \cdot x}{3 \cdot 2} + \frac{x^2}{3 \cdot 2} = \frac{1 \cdot 6}{1 \cdot 6}$$

$$\frac{3x}{6} + \frac{2x \cdot 6}{6} = \frac{6}{6}$$

$$3x + 2x = 6$$

$$5x = 6$$

$$x = \frac{6}{5}$$

$$2) \frac{7 \cdot 6}{7 \cdot 5y} + \frac{2 \cdot 5y}{7 \cdot 5y} = \frac{3 \cdot 5}{y \cdot 35} \quad \text{LCD: } 5y \cdot 7 = 35y$$

$$\frac{42}{35y} + \frac{10y}{35y} = \frac{105}{35y}$$

$$42 + 10y = 105$$
$$-42 \quad -42$$

$$\frac{10y}{10} = \frac{63}{10}$$

$$y = \frac{63}{10}$$



# Solving Rational Equations



Obj: Solve rational equations in one variable.

$$p \neq -1, 0$$

Solve. Check your solutions.

$$x \neq -2$$

$$3) \frac{-6}{p(p+1)} + \frac{-4}{\frac{1}{p(p+1)} p(p+1)} = \frac{3(p+1)}{p(p+1)}$$

$$4) \left[ \frac{-2}{x+2} = \frac{x}{x+2} \right] (x+2)$$

LCD:  $p(p+1)$

$$\left[ \frac{-6p}{p(p+1)} + \frac{-4p^2 - 4p}{p(p+1)} = \frac{3p+3}{p(p+1)} \right] p(p+1)$$

~~$-2 = x$~~

No solution

$$-6p - 4p^2 - 4p = 3p + 3$$

$$\begin{array}{r} -4p^2 - 10p = 3p + 3 \\ +4p^2 + 10p \quad \uparrow +10p \\ \hline \end{array}$$

-2 makes 0 in denom.

$$0 = 4p^2 + 13p + 3$$

$$\begin{array}{l} 4p+1=0 \\ 4p=-1 \\ \boxed{p=-\frac{1}{4}} \end{array} \quad \begin{array}{l} 0 = (2p+1)(2p+3) \quad p+3=0 \\ 0 = (4p+1)(p+3) \end{array} \quad \boxed{p=-3}$$





# Solving Rational Equations



Obj: Solve rational equations in one variable.

**Solve. Check your solutions.**

$$\text{LCD: } (x+3)(x+4)$$

$$x \neq -3, -4$$

$$5) \frac{(x+4)^3}{(x+4)(x+3)} = \frac{12x+19}{x^2+7x+12} + \frac{-5(x+3)}{(x+4)(x+3)}$$

$$\left[ \frac{3x+12}{\cancel{\text{LCD}}} = \frac{12x+19}{\cancel{\text{LCD}}} + \frac{-5x-15}{\cancel{\text{LCD}}} \right] \cancel{\text{LCD}}$$

$$3x+12 = \underline{12x+19} - \underline{5x-15}$$

$$\begin{array}{r} 3x+12 = 7x+4 \\ -3x \quad -3x \end{array}$$

$$\begin{array}{r} 12 = 4x+4 \\ -4 \quad -4 \end{array}$$

$$\frac{8}{4} = \frac{4x}{4}$$

$$\boxed{2 = x}$$



# Solving Rational Equations



Obj: Solve rational equations in one variable.

Solve. Check your solutions.

$$6) \frac{3 \cdot 10}{3 \cdot (2x+1)} + \frac{4 \cdot 3(2x+1)}{3 \cdot 3(2x+1)} = \frac{2 \cdot 3(2x+1)}{1 \cdot 3(2x+1)} \quad \text{LCD: } 3(2x+1)$$

$$\left[ \frac{30}{\text{LCD}} + \frac{8x+4}{\text{LCD}} = \frac{12x+6}{\text{LCD}} \right] \quad \text{LCD}$$

$$30 + 8x + 4 = 12x + 6$$

$$\begin{array}{r} 8x + 34 = 12x + 6 \\ -8x \quad -8x \end{array}$$

$$\begin{array}{r} 34 = 4x + 6 \\ -6 \quad -6 \end{array}$$

$$\begin{array}{r} 28 = 4x \\ 4 \quad 4 \end{array}$$

$$\boxed{7 = x}$$

$$2x+1 \neq 0$$

$$\frac{2x}{2} \neq \frac{-1}{2}$$

$$x \neq -\frac{1}{2}$$



# Solving Rational Equations



Obj: Solve rational equations in one variable.

Solve. Check your solutions.

$$\text{LCD: } (x-5)(x-4)$$

$$7) \frac{\overset{(x-4)}{8}}{\underset{(x-4)}{(x-5)}} + \frac{\overset{-9(x-5)}{(x-4)}}{\underset{(x-5)}{(x-4)}} = \frac{5}{\underset{(x-5)(x-4)}{x^2-9x+20}}$$

$$x \neq 5, 4$$

$$\left[ \frac{8x-32}{\cancel{\text{LCD}}} + \frac{-9x+45}{\cancel{\text{LCD}}} = \frac{5}{\cancel{\text{LCD}}} \right] \text{LCD}$$

$$\underline{8x-32} - \underline{9x+45} = 5$$

$$\begin{array}{r} -x + 13 = 5 \\ -13 \quad -13 \end{array}$$

$$\begin{array}{r} -x = -8 \\ -1 \quad -1 \end{array}$$

$$\boxed{x=8}$$