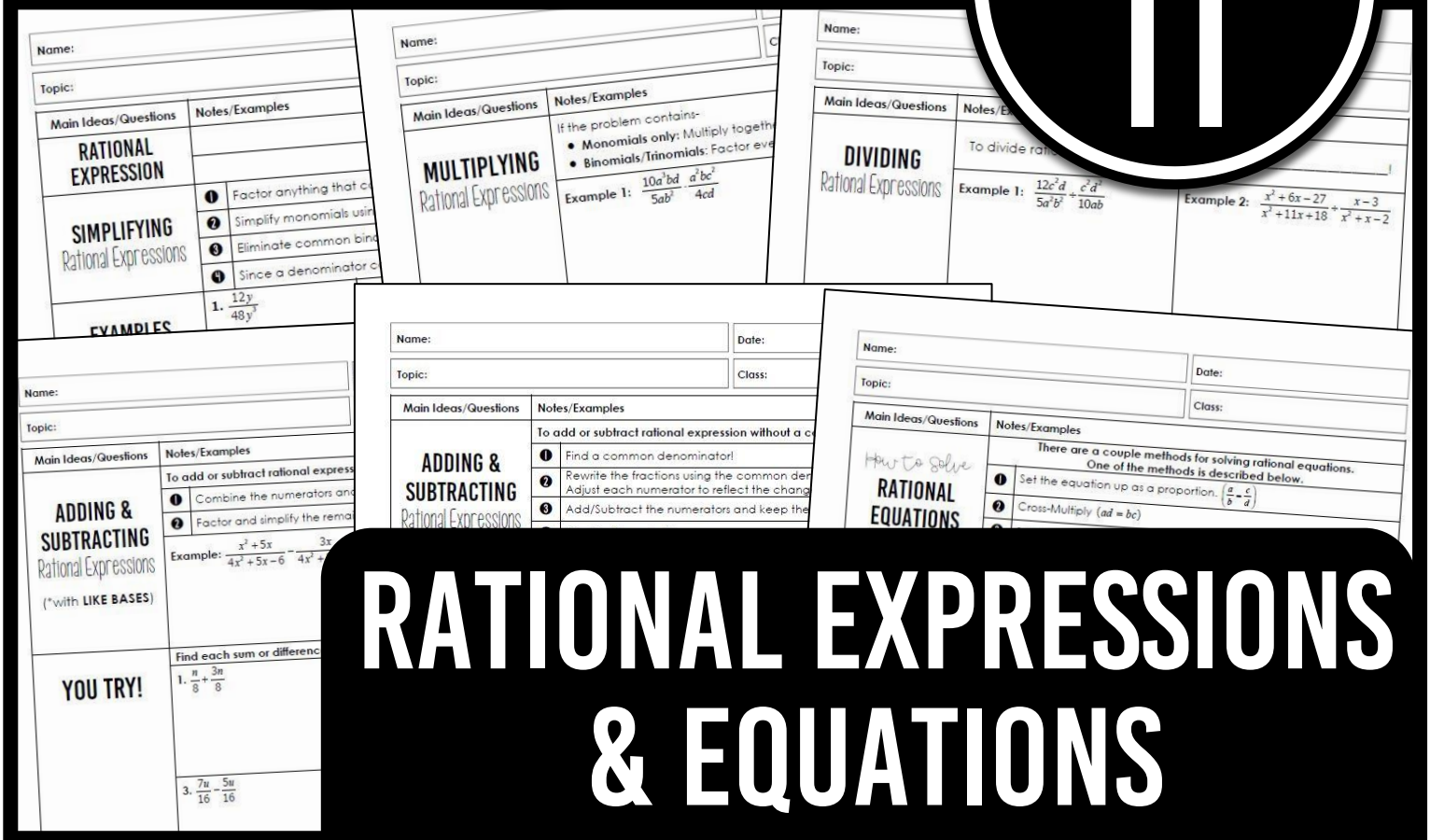
ALGEBRA I

Unit 11



RATIONAL EXPRESSIONS & EQUATIONS

NOTES • HOMEWORK • QUIZZES • TEST

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Unit 11 – Rational Expressions & Equations: Sample Unit Outline

	TOPIC	HOMEWORK
DAY 1	Simplifying Rational Expressions	HW #1
DAY 2	Multiplying Rational Expressions	HW #2
DAY 3	Dividing Rational Expressions	HW #3
DAY 4	**Quiz 11-1**	None
DAY 5	Adding & Subtracting Rational Expressions (Like Bases)	HW #4
DAY 6	Adding & Subtracting Rational Expressions (Unlike Bases)	HW #5
DAY 7	Rational Expressions Review	HW #6
DAY 8	Applications	HW #7
DAY 9	**Quiz 11-2**	None
DAY 10	Rational Equations	HW #8
DAY 11	Unit 11 Review	Study for Test
DAY 12	**UNIT 11 TEST**	None

Name: Date:

Topic:

Main Ideas/Questions	Notes/Examples
RATIONAL EXPRESSION	
SIMPLIFYING Rational Expressions	❶ Factor anything that can be fac ❷ Simplify monomials using the exp ❸ Eliminate common binomial fact ❹ Write what's left!

1. $\frac{12y}{\quad}$ 2. $\frac{21ab}{\quad}$

Name: Date:

Topic:

Main Ideas/Questions	Notes/Examples
MULTIPLYING Rational Expressions	If the problem contains- • **Monomials only:** Multiply to • **Binomials/Trinomials:** Facto Example 1: $\frac{10a^3bd}{5ab^2} \cdot \frac{a^2bc^2}{4cd}$

Name: Date: Class:

Topic:

Main Ideas/Questions	Notes/Examples
DIVIDING Rational Expressions	To divide rational expressions, multiply by the _____ Example 1: $\frac{12c^2d}{5a^2b^2} \div \frac{c^3d^2}{10ab}$ Example 2: $\frac{x^2+6x-27}{x^2+11x+18}$

Name: _____ **Algebra I**

Date: _____ Per: _____ **Unit 11:** Rational Expressions & Equations

Quiz 11-1: Simplifying, Multiplying, & Dividing Rational Expressions

Simplify each expression. Box final answers.

1. $\frac{36x^4}{42x^7}$ 2. $\frac{k^3-k^2-12k}{k^3-9k}$ 3. $\frac{2m^2+11m-6}{m^2-36}$

Name: Date:

Topic: Class:

Main Ideas/Questions	Notes/Examples
ADDING & SUBTRACTING Rational Expressions (*with **LIKE BASES**)	To add or subtract rational expression with a common denomin ❶ Combine the numerators and keep the common denomin ❷ Factor and simplify the remaining expression. Example: $\frac{x^2+5x}{4x^2+5x-6} - \frac{3x}{4x^2+5x-6}$

Name: Date:

Topic: Class:

Main Ideas/Questions	Notes/Examples
ADDING & SUBTRACTING Rational Expressions (*with **UNLIKE BASES**)	To add or subtract rational expression without a common denominator: ❶ Find a common denominator! ❷ Rewrite the fractions using the common denominator. Adjust each numerator to reflect the change in the denominator. ❸ Add/Subtract the numerators and keep the common denominator. ❹ Simplify (if needed). Example 1: $\frac{x}{3} + \frac{x}{2}$ Example 2: $\frac{a+10}{6} - \frac{2a-1}{30}$

RATIONAL EXPRESSIONS Review!

Simplify each expression.

1. $\frac{18m^4n^4}{27m^4n^3}$
2. $\frac{4y-36}{y-9}$
3. $\frac{a^2-13a+42}{a^2+a-56}$
4. $\frac{2k^2-k-1}{2k^2+k}$

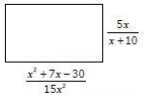
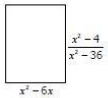
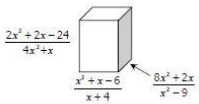
Find each product. Write all answers in simplest form.

5. $\frac{12b^2c^2}{5ac} \cdot \frac{15a^2b}{3b^2c}$
6. $\frac{2}{2x} \cdot \frac{10x^2+6x}{35x+21}$

...answers.

...xpression that

RATIONAL EXPRESSION Applications

Example	Work and Solution
1. Find an expression to represent the **area** of the rectangle. 	
2. Find an expression to represent the **area** of the rectangle. 	
3. If the **area** of a rectangular garden is $x^2 - 36$ and the length is $x^2 - 2x - 24$, find an expression to represent the width of the garden.	
4. If the **area** of a rectangular garden is $6x^2 - 13x - 5$, and the width is $x - 3$, find an expression to represent the length of the rectangle.	
5. Find an expression to represent the **volume** of the rectangular prism shown below. 	

Name: Date:

Topic:

Main Ideas/Questions	Notes/Examples
How to Solve **RATIONAL EQUATIONS**	There are a couple meth... One of the met... ❶ Set the equation up as a p... ❷ Cross-Multiply ($ad = bc$) ❸ Solve the remaining equat... ❹ Check for **extraneous** solut...
EXAMPLES	Directions: Solve each equation...

1. $\frac{18}{x-1} = \frac{6}{x+3}$
3. $\frac{a}{6} = \frac{a-3}{4}$
5. $\frac{w}{w+3} = \frac{5}{w+7}$
7. $\frac{x+1}{x} = \frac{-7}{x-12}$
9. $\frac{15}{k^2-1} = \frac{5}{2k-2}$

Unit 11 Test Study Guide (Rational Expressions & Equations)

Name: _____

Date: _____

Topic 1: Simplifying Rational Expressions

Directions: Simplify each expression.

1. $\frac{16xy^5}{42x^2y^3}$
2. $\frac{r^2+2r}{5r+10}$
3. $\frac{6k^2-11k+4}{9k^2-16}$
4. $\frac{y^3-y}{y^3+8y^2-9y}$

Topic 2: Operations with Rational Expressions

Directions: Perform the indicated operation. Give each answer in simplest form.

5. $\frac{5v^3}{7v^2} \cdot \frac{21v^2}{20v}$
6. $\frac{a^2+a-6}{a^2-a-2} \cdot \frac{a^2+5a+4}{a^2+2a-3}$
7. $\frac{10m+10}{8m^2+12m} \cdot \frac{2m^2+m-3}{m^2-1}$
8. $\frac{6q^3}{8q^2} \div \frac{9q}{8q^2}$
9. $\frac{c^2-6c+8}{c^2-2c} \div (3c-12)$
10. $\frac{p^2-36}{2p^2+3p+1} \div \frac{4p-24}{8p+4}$

Name: _____

Date: _____ Per: _____

Algebra I Unit 11 Test

(Rational Expressions & Equations)

SHOW ALL WORK NEEDED TO ANSWER EACH QUESTION!

PLACE YOUR FINAL ANSWER IN THE BOX. GOOD LUCK! ☺

For questions 1-2, simplify each expression.

1. $\frac{8m^4n^2}{36mn^3}$
2. $\frac{k^2-8k+16}{k^2-16}$

For questions 3-11, perform the indicated operation. Give each answer in simplest form

3. $\frac{3xy^3}{7x^2y^2} \cdot \frac{21xy}{6y^4}$
4. $\frac{3a-5}{8} \cdot \frac{2a+2}{3a^2-2a-5}$
5. $\frac{20}{27a^2b^2} \div \frac{8b^5}{15a^3}$
6. $\frac{2x^2-8x-42}{6x^3} \div \frac{x^2-9}{x^2-3x}$
7. $\frac{9p+37}{p^2-36} - \frac{2p-5}{p^2-36}$
8. $\frac{c^2-3c}{c^2-10c+21} + \frac{c-35}{c^2-10c+21}$