

Math 11: Unit 6: Rational Expressions and Equations
Unit 6.1: Review of factoring

A. GCF
Ex: $3x^2+12x$
 =

B. $ax^2+bx+c, a = 1$

 ex: $x^2+7x+12$

c. $ax^2+bx+c, a>1$

 Ex: $12x^2-5x-2$

-do handout: sec 2.10 (front): #1, 5, 8, 29, 31, 50
 back: #8-15: 2 each

Math 11: Unit 6.1b: Rational Expressions

A. Definitions:

-rational numbers: can write as a fraction $\frac{A}{B}$, $B \neq 0$

Ex:

-rational expressions: write polynomials as a fraction

Ex:

- Note: numbers that make the denominator = 0 are called **restrictions** because they are *non-permissible*.

Ex: find the restrictions for: $\frac{1}{2x-3}$

Ex: find the restrictions for: $\frac{1}{x^2+7x+12}$

B. How to reduce Rational Expressions?

Ex: $\frac{x^2-1}{x^2+3x-2}$

C. What is an 'additive inverse'?

Ex: 5 and -5 are 'additive inverses' of each other...as they add up to 'zero'

And so are (x-9) and (9-x)...they add up to 'zero' too!

-additive inverses in rational expressions simplify to become -1...we can use this property to help us:

Ex: $\frac{x-9}{9-x}$

Ex: $\frac{x^2-81}{9-x}$

Try: simplify and restrictions

1) $\frac{x^2+6x-27}{x^2-6x+9}$

3) $\frac{12-3x}{x^2+x-20}$

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

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

Do: -WB pg 194 #3-5: left
-optional: handout #4-15: 4 from each
-quiz next day (6.1 and 6.1b)

Math 11: unit 6.2: Multiply and Divide Rational Expressions

A. How to multiply?

-remember how to do: $\frac{2}{5} \cdot \frac{15}{16}$

-now:

$$\text{Ex: } \frac{x+1}{x^2-5x+6} \cdot \frac{x-2}{x^2+5x+4}$$

$$\text{Ex: } (x-7) \cdot \frac{(x^3 \cdot x^2)}{x^2-8x+7}$$

$$\text{Ex: } \frac{a^2b}{c-1} \cdot \frac{a}{bc-b}$$

B. How to divide?

-remember: $\frac{1}{3} \div \frac{5}{6}$

-same for rational expressions, but watch out for restrictions:

Ex: $\frac{x+3}{x-3} \div \frac{x}{4x-12}$

Ex: $\frac{x^2+8x+12}{x^2+15x+56} \div \frac{3x+6}{x+7}$

Try: reduce and restrictions:

1)

2)

3)

4)

-WB pg 201 #2-3: left

-optional handout 6.2: #1-54(odd)

-quiz on unit 6.1 (simplify rational) and 6.2(multiply and divide rational)
next day

Math 11: Unit 6.3: +/- Rational Expressions (part 1)

How to do it:

-Lowest Common Denominator!

-remember: $\frac{1}{3} + \frac{5}{4}$

-same with rational expressions...you need a common denominator.

$$\text{ex: } \frac{1}{3x} + \frac{5}{4x}$$

$$\text{Ex: } \frac{1}{3x} + \frac{5}{4}$$

$$\text{Ex: } \frac{1}{4x} + \frac{5}{4x}$$

- Do WB pg 209 #3: left
- handout: part 1: 3 each

Math 11: Unit 6.3: +/- Rational Expressions Part 2

A. How to do it?
-find LCD!

Remember: $\frac{1}{3} + \frac{5}{4}$

-same with rational expressions

Ex: $\frac{2x+4}{x^2-9} - \frac{7x+10}{x^2-9}$

Ex: $\frac{9}{2x+4} - \frac{5}{3x+6}$

$$\text{Ex: } \frac{6x}{x-5} - \frac{240}{x^2-2x-15}$$

$$\text{Ex: } \frac{3x+3}{x^2+5x+4} - \frac{x-3}{x^2+x-12}$$

$$\text{Ex: } \frac{2x+11}{x^2+x-6} - \frac{3}{2-x}$$

-do WB pg 210 #4: left

-or handout part 1: #5-14 ace, 16, 17

part 2: 1, 4, 6, 13, 14, 17: abc

-quiz next day on +/- rational expressions

Math 11: unit 6.4: mixed operations with rational equations

-remember BEDMAS?

...if we can use this process for regular numbers, we can apply it to rational equations also!

$$\text{Ex: } \frac{5}{6} + \frac{1}{4} \div \frac{1}{20}$$

$$\text{so: } \frac{x+5}{x+6} + \frac{1}{x+4} \div \frac{x+6}{x^2-x-20}$$

$$\text{Ex: } \frac{\frac{x^2}{y^3}}{\frac{x^5}{y^7}}$$

$$\text{ex: } (x^{-1} - y^{-1})^{-3}$$

WB pg 216 #1: left
#2: pick 5
#4

Math 11: Unit 6.5: Solving Rational Equations

-use algebra and always check answers! (may get a 'bogus' solution)

$$\text{Ex: } x + \frac{4}{x} = 4$$

$$\text{Ex: } \frac{5x}{x-4} + 2 = \frac{3x+8}{x-4}$$

$$\text{Ex: } \frac{x^2+25}{x-7} + \frac{x+5}{2} = \frac{2x^2-12x-9}{2(x-7)}$$

$$\text{Ex: } \frac{5x}{x-4} + 2 = \frac{3x+8}{x-4}$$

- do WB pg223 #2abcd
#3-5: pick 3 from each
#6abcd
- review, pretest, corrections, test