Today's Objectives

Perform mathematical operations with rational expressions to solve real-world problems and write answers in complete sentences that describe the real-world meaning using sentence stems.

Success Criteria:

- Write factored forms of rational expressions
- Subtract rational expressions using least common denominators
- Use polynomial factoring to simplify multiplied and divided rational expressions.

Vocabulary: numerator, denominator, extraneous solution, least common denominator (LCD), greatest common factor (GCF), prime number, prime polynomial, irreducible quadratic, linear

LCD: $(x+1)(x+8)$

AM: Subtract Rational Expressions

Subtract:

1. $-\frac{3}{x^2+9x+8} - \frac{9}{x+1}$

[A] $\frac{-9x-75}{x^2+9x+8}$ [B] $\frac{-9x+5}{x^2+9x+8}$ [C] $-\frac{12}{x^2+8x+7}$ [D] $\frac{-9x+69}{x^2+9x+8}$

$$\frac{-3}{(x+1)(x+8)} - \frac{9}{(x+1)} \cdot \frac{(x+8)}{(x+8)} =$$

$$\frac{-3}{(x+1)(x+8)} - \frac{9x-72}{(x+1)(x+8)} = \frac{-9x-75}{x^2+9x+8}$$

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

AM: Subtract Rational Expressions

2. $\frac{7}{x+3}-\frac{4}{x-3}$ [A] $\frac{3}{x^2-9}$ [B] $\frac{3}{x-3}$ [C] $\frac{3x-33}{x+3}$ [D] $\frac{3x-33}{x^2-9}$

$3x \quad -33$

$\frac{7}{x+3}\cdot\frac{x-3}{x-3} - \frac{4}{x-3}\cdot\frac{x+3}{x+3} = \frac{7x-21-4x-12}{(x-3)(x+3)}$

x^2-9

LO: The least common denominator is needed to add these rational functions, therefore we must factor the polynomial numerator and denominator into prime polynomials and then construct the LCD by choosing the largest power of each linear or irreducible quadratic to be a factor in the LCD.

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

AM: Subtract Rational Expressions

3. $\dfrac{x+3}{x^2+x-12} - \dfrac{x+4}{x^2+3} = \dfrac{(x+3)(x+3)}{(x+4)(x-3)} - \dfrac{(x+4)(x+4)}{(x+3)(x-3)(x+4)}$

$-4, 3$

[A] $-\dfrac{1}{(x+4)(x+3)(x-3)}$

[B] $-\dfrac{1}{(x-4)(x+3)(x-3)}$

[C] $\dfrac{-2x-7}{(x-4)(x+3)(x-3)}$

[D] $\dfrac{-2x-7}{(x+4)(x+3)(x-3)}$

$\dfrac{x+3(x+3)}{(x+4)(x-3)} \quad \dfrac{(x+4)(x+4)}{(x+3)(x+4)} = \dfrac{x^2+6x+}{(x+4)(x-3)(x}$

$-\dfrac{(x^2+8x+16)}{-(x+4)(x-3)(st}$

rs

$= \dfrac{-2x-7}{(x+4)(x-3)(x+}$

5