Station 1: Rational Expressions — Combine & Reduce

Goal: Practice rational simplification by factoring and reducing

Simplify each of the following rational expressions

1. $\frac{x^2-9}{x^2-x-6}$

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

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

Station 2: Factor Then Simplify

Goal: Recognize factoring opportunities inside larger expressions

Simplify each of the following expressions

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

2. $\frac{x^2+5x+6}{x^2-x-6}\cdot\frac{x^2-4x-12}{x^2+7x+12}$

3. $\frac{4x^2-9}{2x+3}$

Station 3: Basic Exponent Rules — Multiply, Divide, Power of a Power

Goal: Reinforce foundational exponent rules.

Simplify each of the following using exponent properties

1. $\dfrac{x^2y^4}{(2xy)^3}$

2. $\left(\dfrac{x^{-3}}{3}\right)^{-2}$

3. $\sqrt{x^3} \cdot \sqrt[3]{x^2}$

4. $\left(\dfrac{\sqrt{x}}{x^{1/4}}\right)^3$

Station 4: Complex Fractions — Clean It Up

Goal: Simplify complex (fractions within fractions) expressions by identifying least common denominators and multiplying strategically.

Simplify each of the complex fractions

1. $\dfrac{3+\frac{2}{x}}{1-\frac{1}{x}}$

2. $\dfrac{\frac{6}{x+5}-\frac{1}{x}}{\frac{-2}{x}}$

Station 5: Expressions You'll Likely See in Calculus

Goal: Work with expressions resembling those in Calculus

Simplify each of the following expressions

1. $\dfrac{(x+h)^2-x^2}{h}$

2. $\dfrac{\dfrac{1}{x+h}-\dfrac{1}{x}}{h}$