

Read about simplest form and then do step one of t

A rational expression is in **simplest form** when its numerator and denominator are polynomials that have no common divisors.

In simplest form

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

Not in simplest form

$$\frac{x}{x^2} \quad \frac{\frac{1}{x}}{x+1} \quad \frac{2(x-3)}{3(x-3)}$$

Simplify $\frac{x^2 + 10x + 25}{x^2 + 9x + 20}$. State any restrictions on the variable.

Step 1: Factor

Handwritten work for Step 1: Factor. The expression $\frac{x^2 + 10x + 25}{x^2 + 9x + 20}$ is shown with the numerator factored as $(x+5)(x+5)$ and the denominator factored as $(x+4)(x+5)$. The common factor $(x+5)$ is crossed out from both the numerator and denominator. The final simplified expression is $\frac{x+5}{x+4}$, with the restriction $x \neq -5$ noted.

Step 2: Find discontinuities

$$\begin{aligned} x+4 &= 0 & x+5 &= 0 \\ x &= -4 & x &= -5 \end{aligned}$$

Step 3: Simplify

$$\frac{x+5}{x+4}, x \neq -4, -5$$