

Addressing Misconceptions in Simplifying Rational Expressions

Part 1: For each scenario below, state whether you can or can not simplify as shown. Provide an example with numbers (don't choose 0 or ±1 for your variables) to prove your point and then explain your choice in your own words.

Scenario (circle yes or no)	Example with Numbers for Support	Explanation
$\frac{x}{(x+1)} = \frac{1}{1+1}$ <p>YES or NO</p>	$\frac{5}{5+1} \stackrel{?}{=} \frac{1}{1+1}$ $\frac{5}{6} \neq \frac{1}{2}$ <p>correct ↓</p>	<p>The (x+1) is grouped together.</p>
$\frac{x+1}{x} = \frac{1+1}{1}$ <p>YES or NO</p>	$\frac{5+1}{5} \stackrel{?}{=} \frac{2}{1}$ $\frac{6}{5} \neq \frac{2}{1}$	<p>The (x+1) is grouped together. It would be like doing $\frac{28}{22} = \frac{8}{2} = 4$. Not true</p>
$\frac{(x^2+2x+1)}{(x^2+4x-8)} = \frac{2x+1}{4x-8}$ <p>YES or NO</p>	$\frac{5^2+2(5)+1}{5^2+4(5)-8} \stackrel{?}{=} \frac{2(5)+1}{4(5)-8}$ $\frac{36}{37} \neq \frac{11}{12}$	<p>Same as prior two. x² is part of a bigger expression.</p>
$\frac{(x+1)}{(x+1)x} = \frac{1}{x}$ <p>YES or NO</p>	$\frac{(5+1)}{(5+1)(5)} = \frac{1}{5}$ $\frac{6}{30} = \frac{1}{5}$ $\frac{1}{5} = \frac{1}{5}$	<p>(x+1) are the same expression on opposite sides of the same fraction</p>
$\frac{x}{(x+1)} + \frac{(x+1)}{(x+2)} = \frac{x}{1} + \frac{1}{x+2}$ <p>YES or NO</p>	$\frac{5}{(5+1)} + \frac{(5+1)}{(5+2)} \stackrel{?}{=} \frac{5}{1} + \frac{1}{5+2}$ $\frac{5}{6} + \frac{6}{7} \neq 5 + \frac{1}{7}$	<p>(x+1) are not on opposite sides of the same fraction. It would be like doing the following $\frac{1}{2} + \frac{2}{3} = \frac{1}{3}$ Not true</p>
$\frac{x}{(x+1)} \cdot \frac{(x+1)}{(x+2)} = \frac{x}{1} \cdot \frac{1}{x+2}$ <p>YES or NO</p>	$\frac{3}{4} \cdot \frac{4}{5} \stackrel{?}{=} \frac{3}{1} \cdot \frac{1}{5}$ $\frac{12}{20} = \frac{3}{5}$ <p>Correct ↓</p>	<p>$\frac{x(x+1)}{(x+1)(x+2)}$ (x+1) and (x+1) are on opposite sides of the same fraction.</p>

$$\left[\frac{3}{5} \right] = \left[\frac{3}{5} \right]$$

Part 2: Now, come up with two examples of your own (they can both work, both fail, or one of each). Then, switch with another group and have them answer the ones you came up with.

<u>Scenario</u> (circle yes or no)	<u>Example with Numbers for Support</u>	<u>Explanation</u>
YES or NO		
YES or NO		

Part 3: Finally, come up with a general rule/description for when you can simplify rational expressions. Write your rule/description below.

Now, go through the six scenarios on the front page and verify that if someone followed your rule, they would correctly simplify each rational expression.

<u>Scenario</u>	<u>Why Your Rule Works for This Scenario</u>
1	
2	
3	
4	
5	
6	