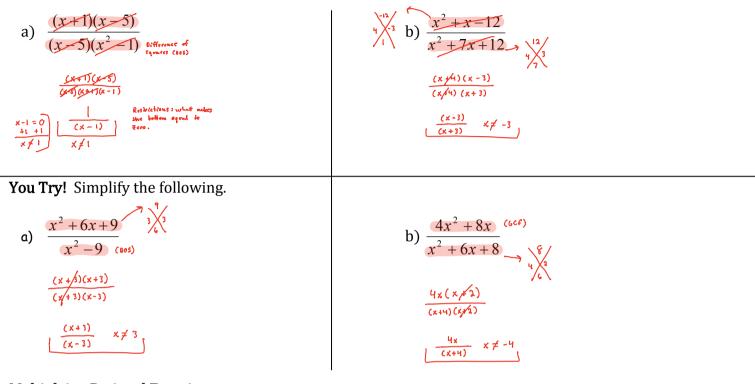
Math 3 Unit 5 Day 3 Notes – Multiplying & Dividing Rational Expressions

Name:	Key
Date:	

Example 1: Simplify the following.



Multiplying Rational Functions

When multiplying rational functions, meaning you are multiplying two factions together, you multiply straight across the top and straight across the bottom, simplifying where you can.

$$\frac{a \cdot c}{b \cdot d} = \frac{ac}{bd}$$

Example 2: Simplify completely. **Example 3:** Simplify Completely. $\frac{x^{2}+2x-8}{x^{2}+4x+3} \frac{3x+3}{x-2}$ (6cf) $(pos) x^2 - 9 x + 2$ $\frac{x+2}{x^2+5x+6} \cdot \frac{x+2}{3x-9} \quad (b < cf)$ $\frac{x+2}{3x-9} \quad (b < cf)$ $\frac{x+3}{(x+3)(x+3)} \cdot \frac{(x+2)}{3(x+3)}$ $\frac{(x+4)(x/\lambda)}{(x+3)(x/1)} \cdot \frac{3(x/1)}{(x/\lambda)}$ $\frac{3(x+4)}{(x+3)} \quad x \neq -3$ $\frac{1}{3}$ You Try! Multiply the following & state the restrictions. $\frac{3}{1-2} b) \frac{x^2 + x - 6}{x - 5} \cdot \frac{x^2 - 25}{x^2 + 4x + 3} \frac{3}{1\sqrt{3}}$ $\frac{t^{2}+19t+84}{4t-4} \cdot \frac{2t-2}{t^{2}+9t+14} \rightarrow \frac{t^{4}}{t^{7}}$ $\frac{(x+3)(x-2)}{(x-5)} \cdot \frac{(x+5)(x-5)}{(x+1)(x+5)}$ $\frac{(x + i\lambda)(x + 1)}{4(x - 1)} \cdot \frac{\lambda(x - 1)}{(x + \lambda)(x + 1)}$ $\frac{(x-\lambda)(x+5)}{(x+1)} \quad x \neq -1$ $\frac{\lambda(x+1\lambda)}{H(x+\lambda)}$ $\frac{(\chi+i2)}{2(\chi+2)} \quad \chi \neq -2$

Dividing Rational Functions

When dividing rational functions, you multiply the first fraction by the **reciprocal** of the second fraction, simplifying where you can. SAME-CHANGE-FLIP!

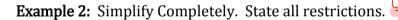
$$\frac{\overset{k}{a}}{b} \div \frac{\overset{c}{c}}{d} = \frac{a}{b} \underbrace{\overset{\star}{\bullet}}{c} = \underbrace{ad}_{bc}$$

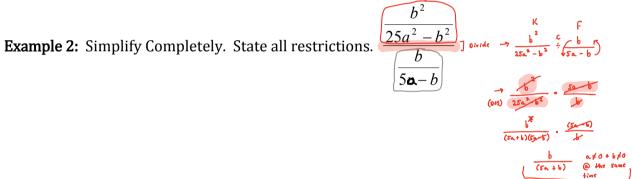
Example 1: Simplify completely and state the restrictions.

$$\frac{a+2}{a+3} \stackrel{c}{\leftrightarrow} \frac{a^2+a-12}{a^2-9} \xrightarrow{(x+2)} \frac{(x+2)}{(x+3)} \cdot \frac{x^2-9}{x^2+x^{-12}} \stackrel{(005)}{(x+3)}$$

$$\frac{(x+2)}{(x+3)} \cdot \frac{(x-3)(x+3)}{(x+4)(x-3)}$$

$$\frac{(x+2)}{(x+4)(x-3)} \times \frac{(x+2)}{(x+4)(x-3)}$$





You Try! Divide the following. Be sure to state all restrictions.

a)
$$\frac{\frac{-12b+18}{b^2-25}}{\frac{4b-6}{b^2-3b-10}} \rightarrow \frac{\frac{-(2b+1)^8}{b^2-25}}{\frac{4b-6}{b^2-3b-10}} \div \frac{\frac{4b-6}{b^2-3b-10}}{\frac{-(2b+1)^8}{b^2-25}} \div \frac{\frac{4b-6}{b^2-3b-10}}{\frac{4b-6}{4b-6}} - 5 \int_{-3}^{10} x^2 + \frac{3(x+4)}{2(x+4)} \div \frac{(x+4)}{x+2} + \frac{3(x+4)}{2(x+4)} \div \frac{(x+4)}{(x+4)(x+4)} + \frac{3(x+4)}{2(x+4)} \div \frac{(x+4)}{2(x+4)} + \frac{3(x+4)}{2(x+4)} \div \frac{(x+4)}{2(x+4)} + \frac{3(x+4)}{2(x+4)} + \frac{3(x+4)}$$