

SIMPLIFYING COMPLEX RATIONAL FUNCTIONS

Examples:

1. Factor 2. Multiply both the numerator and denominator by LCD 3. Simplify

<p>(a)</p> $1 - \frac{4 - y^2}{4 - 2y}$ $1 - \frac{(2 + y)(2 - y)}{2(2 - y)}$ $\frac{2}{2} \cdot 1 - \frac{2 + y}{2}$ $\frac{2}{2} - \frac{2 + y}{2}$ $\frac{2 - 2 - y}{2}$ $-\frac{y}{2}$	<p>(b)</p> $\frac{x^{-1} - x^{-2}y^2}{(xy)^{-1} - x^{-2}y}$ $\frac{\frac{x^2y}{1} \cdot \left(\frac{1}{x} - \frac{y^2}{x^2}\right)}{\frac{x^2y}{1} \cdot \left(\frac{1}{xy} - \frac{y}{x^2}\right)}$ $\frac{xy - y^3}{x - y^2}$ $\frac{y(x - y^2)}{x - y^2}$ y	<p>(c)</p> $\frac{2x^2y^{-2} - 6y^{-1}}{xy^{-2} - 3(xy)^{-1}}$ $\frac{\frac{xy^2}{1} \cdot \left(\frac{2x^2}{y^2} - \frac{6}{y}\right)}{\frac{xy^2}{1} \cdot \left(\frac{x}{y^2} - \frac{3}{xy}\right)}$ $\frac{2x^3 - 6xy}{x^2 - 3y}$ $\frac{2x(x^2 - 3y)}{x^2 - 3y}$ $2x$
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Simplify each rational expression. Use a separate sheet of paper.

a) $\frac{x - xy}{x^2}$	b) $\frac{y}{1 + x} + \frac{1 + x}{y}$	c) $\frac{1 + x}{x} + \frac{1 - y}{y}$	d) $\frac{x - xy}{1 - y^2}$	e) $1 - \frac{1 - x^2}{1 + x}$	f) $\frac{1 - 2x + x^2}{1 - x^2}$
g) $\frac{1 + \frac{1}{x}}{1 - \frac{1}{x}}$	h) $\frac{\frac{x + y}{y} + \frac{y}{x}}{\frac{1}{xy}}$	i) $\frac{x}{1 - \frac{y}{x}} + \frac{y}{1 - \frac{x}{y}}$	j) $\frac{\frac{1}{x}}{\frac{1}{y}} + \frac{y}{x}$	k) $\frac{\frac{1}{x} + \frac{y}{x}}{\frac{x}{y} + x}$	l) $\frac{1 + y}{1 - y} - \frac{1 - y}{1 + y}$

Answers (jumbled)

$x^2 + y^2$	$\frac{x + y}{xy}$	$\frac{1 - y}{x}$	$\frac{x}{1 + y}$	$\frac{x^2 + 2x + 1 + y^2}{y + xy}$	$\frac{y}{x^2}$
$\frac{4y}{1 - y^2}$	$\frac{2y}{x}$	$\frac{x + 1}{x - 1}$	$x + y$	x	$\frac{1 - x}{1 + x}$