Complex Rational Expressions

1. Simplify each of these complex rational expressions. If there is only one variable, state any restricted domain.

a) $\dfrac{\frac{1}{2}-3}{\frac{1}{2}+3}$

b) $\dfrac{\frac{7}{y}}{y^2+2y}$

c) $\dfrac{\frac{3}{z^2-4}}{\frac{z}{z^2-4}}$

d) $\dfrac{5+\frac{1}{x-1}}{\frac{1}{x-1}}$

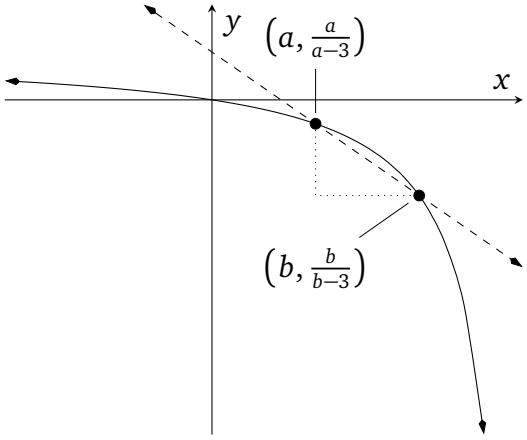
e) $\dfrac{\frac{1}{p^2q}+\frac{1}{pq^2}}{\frac{p+q}{pq}}$

f) $\dfrac{\frac{2}{x-1}}{\frac{1}{x-1}+\frac{1}{x-2}}$

g) $\dfrac{\dfrac{x}{x^2-4}-\dfrac{1}{x^2-4}}{\dfrac{1}{x+4}}$

h) $\dfrac{a^2+4a+3}{\dfrac{a+5}{a+4}+\dfrac{2}{a+2}}$

2. In this picture, we see the graph of $y = \frac{x}{x-3}$. Two points are singled out. The straight line connecting them is overlaid, including a slope triangle.



a) What is the "run" on the slope triangle? (What is the length of the horizontal leg of the triangle?) The answer is a pretty simple math expression using a and b.

b) What is the "rise" on the slope triangle? (What is the length of the vertical leg of the triangle?) The answer is a math expression that you should not try to simplify.

c) What is the slope of the line? The answer should start out as a complex rational expression, and then you should simplify it.