SM3-A HANDOUT 4-2 Add and Subtract Rational Expressions

No common denominator.

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

Multiply the left side fraction by <u>one</u> in the form of 3/3
Multiply the right side fraction by <u>one</u> in the form of 2/2

$$\frac{3}{3} * \frac{(2x-1)}{2x} + \frac{(x-2)}{3x} * \frac{2}{2} = \frac{3(2x-1)}{2*3*x} + \frac{2(x-2)}{2*3*x}$$

$$= \frac{3(2x-1)+2(x-2)}{6x} = \frac{6x-3+2x-4}{6x} = \frac{8x-7}{6x}$$

Can you factor this into two fractions multiplied together?

$$\frac{x}{3} - \frac{x+1}{6}$$

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

$$\frac{3x+1}{2x} - \frac{1}{5}$$

$$\frac{12}{x^2+5x-24} + \frac{3}{x-3}$$ (step by step)

What is the factored version of the left denominator?

$$\frac{12}{(x+8)(x-3)} + \frac{3}{(x-3)}$$

What is the least common denominator?

$$(x+8)(x-3)$$

$$\frac{12}{(x+8)(x-3)} + \frac{3}{(x-3)}$$

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

Simplify the complex fraction. $\quad \dfrac{\frac{1}{2}}{\frac{5}{6}} = \dfrac{1}{2} \div \dfrac{5}{6}$

Division: Division by a number is the same thing as…

Multiplication by the reciprocal of the number.

$$\frac{\frac{1}{2}}{\frac{5}{6}} = \frac{1}{2} \div \frac{5}{6} = \frac{1}{2} * \frac{6}{5} = \frac{3}{5}$$

Simplifying complex fractions:

Complex Fraction is a fraction in the numerator and a fraction in the denominator.

$$\frac{\frac{2}{3}}{\frac{4}{5}} = \frac{2}{3} \div \frac{4}{5} = \frac{2}{3} * \frac{5}{4} = \frac{\cancel{2}}{\cancel{2}} * \frac{5}{3*2} = \frac{5}{6}$$

How do you divide fractions?

Multiply by reciprocal.

Simplify the complex fraction.

$$\frac{\dfrac{5}{x+4}}{\dfrac{3}{x+4}}$$

$$\frac{\dfrac{x}{x+2}}{\dfrac{3}{x+3}}$$

Combine the numerator fractions into one fraction.
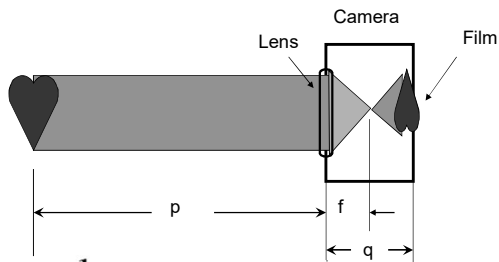
$$\frac{\dfrac{x}{3} - 6}{2 + \dfrac{3}{x}}$$

$$\frac{\dfrac{1}{x} + \dfrac{2}{3x}}{3}$$
$$\overline{x+4}$$

$$R_{total} = R_1 + R_2 + R_3$$

Voltage Source

R_1, R_2, R_3

$$\frac{1}{R_{total}} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$$

$$\frac{1}{R_T} = \frac{R_2 R_3}{R_1 R_2 R_3} + \frac{R_1 R_3}{R_1 R_2 R_3} + \frac{R_1 R_2}{R_1 R_2 R_3}$$

$$\frac{1}{R_T} = \frac{R_2 R_3 + R_1 R_3 + R_1 R_2}{R_1 R_2 R_3} \qquad R_T = \frac{R_1 R_2 R_3}{R_2 R_3 + R_1 R_3 + R_1 R_2}$$

Focal length of a telescope/microscope

Camera
Lens
Film
p
f
q

$$f = \frac{1}{\dfrac{1}{p} + \dfrac{1}{q}} \qquad f = \frac{1}{\dfrac{q+p}{pq}} \qquad f = \frac{pq}{q+p}$$