

1. Simplify the following complex rational expressions. If upon simplifying there is a domain change, make note of it.

a.
$$\frac{2t - \frac{1}{2t}}{2t + \frac{1}{2t}}$$

c.
$$\frac{\frac{1}{z+1} - \frac{1}{z-1}}{\frac{2}{z+2} - \frac{2}{z-2}}$$

b.
$$\frac{1 - \frac{1}{x}}{1 + \frac{1}{2x}}$$

d.
$$\frac{\frac{t}{t+3} + \frac{2}{t-3}}{1 - \frac{t}{t^2-9}}$$

2. Solve the following quadratic equations.

a.
$$\frac{y-4}{3y-2} = \frac{3}{4}$$

b.
$$\frac{y}{2y+12} + \frac{6}{y+6} = 2$$

c. $-\frac{4}{x+3} = -\left(\frac{2}{x-3} + \frac{6}{x^2-9}\right)$

d. $-\frac{8}{y-3} + \frac{4y}{y-5} = -\frac{8}{y^2-8y+15}$

3. Two people are working together to paint a room. Person A works 1.5 times as fast as person B. If they work together, it takes them 9 hours to complete the job. How long would it take person A to paint the room alone? How about person B?

4. Without any wind an airplane flies at 300 miles per hour. The plane travels 600 miles into the wind and then returns with the wind in a total time of 4.04 hours. Find the speed of the wind.