

Section 6.7 (Solving Fractional Equations)

In technical fields there are many situations involving algebraic fraction that are equations that we must solve. Please note: you are solving a rational equation if there is an equal sign in the problem; so far in this chapter the problems have not involved solving the equation because there has been no equal sign. To solve these equations we will multiply both sides of the equation by the Least Common Denominator; this will allow us to eliminate the denominator in the fraction making it very easy to solve.

The objective for this section is to:

- Solve equations involving fractions
- Solve real world application problems involving fractional equations

To solve an rational equation

1. Factor the DENOMINATOR ONLY.
2. Find the Least Common Denominator
3. Multiply both side of the equation by the LCD, **CAUTION:** Your goal is to clear the denominators, not to get common denominators.
4. Solve the resulting equation (May be 1 or 2 solutions)
5. Check your answer(s) in the original equation. You do not want to find a denominator of zero.

Solve for the variable in the equation.

1. $\frac{y}{3} + \frac{5}{6} = 2$

3. $\frac{x}{4} + 6 = x$

2. $\frac{1}{x} = \frac{1}{8} - \frac{3}{5}$

4. $\frac{5}{2y} + \frac{8}{y} = 1$

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5. $\frac{2x-1}{9} - \frac{1}{3} = 2x$

8. $\frac{x+1}{3} - \frac{x-1}{2} = 1$

6. $\frac{x-7}{x+2} = \frac{1}{4}$

9. $\frac{t+5}{t-2} = \frac{t-2}{t+4}$

7. $\frac{5}{2x-3} = \frac{7}{3x-1}$

10. $\frac{3}{4x-6} + \frac{1}{4} = \frac{5}{2x-3}$

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11. $\frac{x}{x+4} - \frac{4}{x-4} = \frac{x^2+16}{x^2-16}$

12. $\frac{3s}{4a} - \frac{s}{a^2} = \frac{1}{8}$; solve for s

13. $\frac{y}{c} - 2 = \frac{3}{c}$; solve for y

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14. Zoe can rake her yard in 4 hours. Stephanie does the same job in 3 hours. How long would it take the two of them working together, to rake the yard?

15. Bobbi can pick a quart of raspberries in 20 minutes. Brenda can pick a quart in 25 minutes. How long would it take if Bobbi and Brenda worked together?

16. Rosie walks 2 mph slower than Sam. In the time it take Sam to walk 8 miles, Rosie walks 5 miles. Find the speed of each person.

17. The A train goes 12 mph slower than the E train. The A train travels 230 miles in the same time that the E train travels 290 miles. Find the speed of each train.