

SOLVING EQUATIONS CONTAINING ALGEBRAIC FRACTIONS

#17

Fractions that appear in algebraic equations can usually be eliminated in one step by multiplying each term on both sides of the equation by the common denominator for all of the fractions. If you cannot determine the common denominator, use the product of all the denominators. Multiply, simplify each term as usual, then solve the remaining equation. For more information, read the Tool Kit information on page 313 (problem BP-46) in the textbook. In this course we call this method for eliminating fractions in equations "fraction busting."

Example 1

Solve for x : $\frac{x}{9} + \frac{2x}{5} = 3$

$$45\left(\frac{x}{9} + \frac{2x}{5}\right) = 45(3)$$

$$45\left(\frac{x}{9}\right) + 45\left(\frac{2x}{5}\right) = 135$$

$$5x + 18x = 135$$

$$23x = 135$$

$$x = \frac{135}{23}$$

Example 2

Solve for x : $\frac{5}{2x} + \frac{1}{6} = 8$

$$6x\left(\frac{5}{2x} + \frac{1}{6}\right) = 6x(8)$$

$$6x\left(\frac{5}{2x}\right) + 6x\left(\frac{1}{6}\right) = 48x$$

$$15 + x = 48x$$

$$15 = 47x$$

$$x = \frac{15}{47}$$

Solve the following equations using the fraction busters method.

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

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

3. $\frac{16}{x} + \frac{16}{40} = 1$

4. $\frac{5}{x} + \frac{5}{3x} = 1$

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

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

7. $\frac{x}{2} - 4 = \frac{x}{3}$

8. $\frac{x}{8} = \frac{x}{12} + \frac{1}{3}$

9. $5 - \frac{7x}{6} = \frac{3}{2}$

10. $\frac{2x}{3} - x = 4$

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

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

13. $\frac{4}{x} + \frac{2}{x} = 1$

14. $\frac{3}{x} + 2 = 4$

15. $\frac{5}{x} + 6 = \frac{17}{x}$

16. $\frac{2}{x} - \frac{4}{3x} = \frac{2}{9}$

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

18. $\frac{x}{4} + \frac{x+5}{3} = 4$

19. $\frac{x-1}{2x} + \frac{x+3}{4x} = \frac{5}{8}$

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

Answers

1. $x = 6$

2. $x = \frac{6}{5}$

3. $x = 26\frac{2}{3}$

4. $x = 6\frac{2}{3}$

5. $x = 30$

6. $x = 5$

7. $x = 24$

8. $x = 8$

9. $x = 3$

10. $x = -12$

11. $x = \frac{40}{9}$

12. $x = 30$

13. $x = 6$

14. $x = 1.5$

15. $x = 2$

16. $x = 3$

17. $x = 9$

18. $x = 4$

19. $x = -2$

20. $x = 1$