SOLVING EQUATIONS CONTAINING ALGEBRAIC FRACTIONS #23

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. In this course we call this method for eliminating fractions in equations "fraction busting." Also see the textbook, pages 418-19.

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. $x = 1$