

Strange Solutions

Pages 67–70

1. $2x - 4 = 2x + 3$; $-4 = 3$; This equation is a contradiction. There are no solutions.
2. $4x + 12 = 2(2x + 6)$; $4x + 12 = 4x + 12$; $12 = 12$; This equation is an identity. There are infinitely many solutions.
3. $5x - 7 = 8x + 8$; $-3x - 7 = 8$; $-3x = 15$; This equation is neither an identity nor a contradiction. Both sides have different quantities of x . This equation has one solution. The solution is $x = -5$.
4. $3x - 5(x + 6) = -2x - 14$; $3x - 5x - 30 = -2x - 14$; $-2x - 30 = -2x - 14$; $-30 = -14$; This equation is a contradiction. There are no solutions.
5. $3x + \frac{1}{2}(2x - 8) = 5(x - 2)$; $3x + x - 4 = 5x - 10$; $4x - 4 = 5x - 10$; $-x - 4 = -10$; This equation is neither an identity nor a contradiction. Both sides have different quantities of x . This equation has one solution. The solution is $x = 6$.
6. $4(x - 3) + 3(x + 2) = 2(4x - 5) - (x - 4)$; $4x - 12 + 3x + 6 = 8x - 10 - x + 4$; $7x - 6 = 7x - 6$; $-6 = -6$; This equation is an identity. There are infinitely many solutions.
7. $\frac{2x - 15}{2} = x - 7$; $x - 7.5 = x - 7$; $-7.5 = -7$; This equation is a contradiction. There are no solutions.
8. $\frac{3x}{5} - 8 = 2(3x - 10)$; $\frac{3x}{5} - 8 = 6x - 20$; $-\frac{27}{5}x - 8 = -20$; $-\frac{27}{5}x = -12$; This equation is neither an identity nor a contradiction. Both sides have different quantities of x . This equation has one solution. The solution is $x = \frac{20}{9} = 2\frac{2}{9}$.
9. $0.4x - 5.6 = 2(0.2x - 2.8)$; $0.4x - 5.6 = 0.4x - 5.6$; $-5.6 = -5.6$; This equation is an identity. There are infinitely many solutions.
10. $\frac{5(2x - 4)}{4} - 2x = \frac{3(x - 1)}{2} - \frac{2(2x + 7)}{4}$; $\frac{10x - 20}{4} - 2x = \frac{3x - 3}{2} - \frac{4x + 14}{4}$; $2.5x - 5 - 2x = 1.5x - 1.5 - x - 3.5$; $0.5x - 5 = 0.5x - 1.5$; $-5 = -1.5$; This equation is a contradiction. There are no solutions.
11. $6\left(x + \frac{1}{3}\right) = 6x + \frac{2}{3}$; $6x + 2 = 6x + \frac{2}{3}$; Since the variable terms on both sides of the equation are the same but the constant terms are different, the equation has no solution.
12. $3(2a + 1) - 2 = 2(a - 2) + 3(a + 1)$; $6a + 3 - 2 = 2a - 4 + 3a + 3$; $6a + 1 = 5a - 1$; Since the variable terms on both sides of the equation are different, the equation has exactly one solution.
13. $3(x - 2) + 2(x + 5) = 5(x + 1) + 1$; $3x - 6 + 2x + 10 = 5x + 5 + 1$; $5x + 4 = 5x + 6$; Since the variable terms on both sides of the equation are the same but the constant terms are different, the equation has no solution.
14. $4x + 2 = 2(x + 3) + 2(x - 2)$; $4x + 2 = 2x + 6 + 2x - 4$; $4x + 2 = 4x + 2$; Since the variable terms and the constant terms are the same on both sides of the equation, the equation has an infinite number of solutions.
15. $5y + 3 = 3(y - 3) - 2(y + 2)$; $5y + 3 = 3y - 9 - 2y - 4$; $5y + 3 = y - 13$; Since the variable terms on both sides of the equation are different, the equation has exactly one solution.
16. $3t - 2 = 5(t - 2) - 2(t - 4)$; $3t - 2 = 5t - 10 - 2t + 8$; $3t - 2 = 3t - 2$; Since the variable terms and the constant terms are the same on both sides of the equation, the equation has an infinite number of solutions.