

SOLVING LINEAR EQUATIONS

#7

Solving equations involves “undoing” what has been done to create the equation. In this sense, solving an equation can be described as “working backward,” generally known as using inverse (or opposite) operations. For example, to undo $x + 2 = 5$, that is, adding 2 to x , subtract 2 from both sides of the equation. The result is $x = 3$, which makes $x + 2 = 5$ true. For $2x = 17$, x is multiplied by 2, so divide both sides by 2 and the result is $x = 8.5$. For equations like those in the examples and exercises below, apply the idea of inverse (opposite) operations several times. Always follow the correct order of operations. Also see the textbook, pages 171 and 201.

Solve each equation below.

1. $5x + 2 = -x + 14$

2. $3x - 2 = x + 10$

3. $6x + 4x - 2 = 15$

4. $6x - 3x + 2 = -10$

5. $\frac{2}{3}y - 6 = 12$

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

7. $2(x + 2) = 3(x - 5)$

8. $3(m - 2) = -2(m - 7)$

9. $3(2x + 2) + 2(x - 7) = x + 3$

10. $2(x + 3) + 5(x - 2) = -x + 10$

11. $4 - 6(w + 2) = 10$

12. $6 - 2(x - 3) = 12$

13. $3(2z - 7) = 5z + 17 + z$

14. $-3(2z - 7) = -3z + 21 - 3z$

Solve for the named variable.

15. $2x + b = c$ (for x)

16. $3x - d = m$ (for x)

17. $3x + 2y = 6$ (for y)

18. $-3x + 5y = -10$ (for y)

19. $y = mx + b$ (for b)

20. $y = mx + b$ (for x)