

Solving Absolute Value Equations (ALG.ABS.01)

Solve each equation.

1. $|m| = 3$

2. $|n - 4| = 7$

3. $-2|c| = -10$

4. $|w| + 5 = 2$

5. $\frac{|k|}{6} = 3$

6. $|j - 2| = 5$

7. $|6k + 1| = 13$

8. $|-2x| = -16$

9. $|n - 2| + 3 = 6$

10. $-7|n - 2| + 5 = 19$

11. $|5 - 4d| - 10 = 25$

12. $\frac{2}{3}|2c - 3| + 5 = 11$

13. $\left|\frac{3x}{2} - 1\right| = 5$

14. $2|d - 1| + 7 = 3$

15. $\frac{|-3x-5|}{4} = -5$

16. $\frac{2|5y-2|}{-3} + 5 = -7$

17. $\frac{|2k+5|}{3} + 6 = 21$

18. $-4 + |8 + 7b| = 39$

19. $6 + 9|7 - 4y| = 87$

20. $-2|4 - 3m| - 8 = -12$

Solve each equation.

21. $|3x - 1| = |x + 7|$

22. $|9x + 4| = |4x + 9|$

23. $|2x + 7| = 12 - |5x - 2|$

24. $|x + 3| = 4 - |x + 1|$

25. $|5x + 2| = |x + 3| - 7$

26. $|x| - 3x = |x - 12|$

27. $|2x - 1| + x = |3x + 2| - 5$

28. $|5x + 8| + 2 = 2x - |3x| + 10$

29. $|4 - |x - 2|| = 3$

30. $||x + 2| - 8| = \frac{1}{2}x + 6$

31. $|4 + |6x - 1|| = 15 - 2x$

32. $|6 - 3|x + 1|| = |x| - 4$

33. Write an absolute value equation whose solutions are $x = -9, 3$.

34. Write an absolute value equation whose solutions are $x = \frac{5}{2}, -4$

35. Write an absolute value equation whose solutions are $x = b \pm 2a$.

36. Write an absolute value equation whose solutions are $x = y - 3, y + 11$.

37. Is $|x| = |-x|$ always, sometimes, or never true? Justify your answer.

38. Is $|x| = -|x|$ always, sometimes, or never true? Justify your answer.

39. Is $c|a + b| = |ac + bc|$ always, sometimes, or never true? Justify your answer.

40. Which expression is equivalent to $|x - y|$?

a. $|y - x|$

b. $|x + y|$

c. $y - x$

d. $x + y$