Problem 1 – Solving absolute value equations

Solve each equation. If there is no solution, write no solution. Check your answers.

1. $|x| + 5 = 7$ **2.** $|x - 8| = -5$ **3.** $2|x| + 3 = 11$ **4.** $|x + 2| = 6$

5. $|x| - 8 = -3$ **6.** $|x + 2| = 0$ **7.** $|3 - x| = 9$ **8.** $|2x - 3| = 7$

Problem 2 – Absolute value inequalities

Match each absolute value inequality with an equivalent compound inequality.

9. $|x| < 3$

10. $|x| > 6$

11. $|5x| \leq 30$

12. $|x + 18| \geq 12$

13. $|x| < 6$

14. $|x| + 2 > 4$

a. $x < -6$ or $x > 6$

b. $x + 18 \leq -12$ or $x + 18 \geq 12$

c. $-3 < x < 3$

d. $x < -2$ or $x > 2$

e. $-6 < x < 6$

f. $-30 \leq 5x \leq 30$

Write each absolute value inequality as a compound inequality.

15. $|x + 7| > 9$ **16.** $|3x| \leq 6$ **17.** $|x| - 3 > 7$ **18.** $|2.5x| < 4$

Problem 3 – Solving absolute value inequalities

Solve each inequality. If there is no solution, write no solution. Check your answers.

19. $|x + 8| \geq 3$

20. $|x - 2| \leq 1$

21. $|x - 3| \leq 4$

22. $|2x - 5| > 9$

23. $|2x - 3| \geq 7$

24. $|x + 2| > 0$

25. $|3 - x| < 9$

26. $-3|x + 2| > -12$