ILLAWARRA TUTORING

In this worksheet you will master the process of solving equations and inequalities that involve absolute value expressions.

Easy Questions

1. Solve for x in the equation $|x| = 5$.
2. Solve for x in the equation $|x - 2| = 3$.
3. Solve the inequality $|x| < 4$.
4. Solve the inequality $|x - 1| > 2$.
5. Solve for x in the equation $|2x| = 8$.

Intermediate Questions

6. Solve for x in the equation $|3x + 2| = 8$.
7. Solve the inequality $|x - 4| \leq 3$.
8. Solve the inequality $|2x + 1| > 5$.
9. Solve for x in the equation $|x + 2| = |2x - 1|$.
10. Solve the inequality $|3 - x| < 2$.
11. Solve for x in the equation $|2x - 3| = x$.
12. Solve the inequality $|x + 1| \geq 4$.
13. Solve for x in the equation $|4 - x| = 2$.
14. Solve the inequality $|2x - 1| \leq 3$.
15. Solve for x in the equation $|x + 5| = |7 - x|$.
16. Solve for x in the equation $|3x + 4| = |x - 2|$.
17. Solve for x in the equation $2|x - 1| + 3 = 7$.
18. Solve for x in the equation $|5 - 2x| = 3$.
19. Write the solution in interval form for the inequality $|2x + 3| < 7$.
20. Solve the inequality $\left|\frac{x}{2} - 1\right| \geq 2$.

Hard Questions

21. Solve for x in the equation $\big||x| - 3\big| = 2$.

22. Solve the inequality $|2|x - 1| - 3| \leq 1$.

23. Prove that if $|x - a| < b$ where $b > 0$, then $a - b < x < a + b$. Illustrate your proof by taking $a = 5$, $b = 4$, and $x = 2$.

24. Solve for x in the inequality $|3x + 1| + |x - 2| > 7$.

25. Solve for x in the equation $|x - 1| - |x + 2| = 3$.

26. Solve the inequality $\dfrac{|x + 3|}{|x - 2| + 1} < 2$.

27. Solve the inequality $\big|2 - |x|\big| \geq 1$.

28. Solve for x in the equation $|x + 1| + |x - 1| = 4$.

29. Solve for x in the inequality $|x + 4| - |x - 2| < 1$.

30. A point x on a number line is within a distance of 4 from 7. Write the absolute value inequality that represents this situation and solve it for x.