ILLAWARRA TUTORING

In this worksheet you will practise rewriting quadratic equations in completed square form to reveal their solutions using the method of completing the square.

Easy Questions

1. Solve the equation $x^2 + 6x + 5 = 0$ by completing the square.
2. Solve the equation $2x^2 + 8x + 6 = 0$ by completing the square.
3. Solve the equation $x^2 - 4x + 3 = 0$ by completing the square.
4. Solve the equation $x^2 + 10x + 9 = 0$ by completing the square.
5. Solve the equation $x^2 - 2x - 8 = 0$ by completing the square.

Intermediate Questions

6. Rewrite the equation $x^2 + 4x = 1$ in completed square form and hence solve for x.
7. Solve the equation $x^2 - 6x = 7$ by completing the square.
8. Solve the equation $3x^2 + 12x + 4 = 0$ by completing the square.
9. Solve the equation $2x^2 - 4x - 6 = 0$ by completing the square.
10. Rewrite the equation $x^2 + 8x + 15 = 0$ in completed square form and solve for x.
11. Solve the equation $x^2 + 5x = -6$ by completing the square.
12. Solve the equation $4x^2 + 16x + 7 = 0$ by completing the square.
13. Find the value of c for which the equation $2x^2 - 10x + c = 0$ has a repeated real solution. Then rewrite the equation in completed square form.
14. Solve the equation $5x^2 + 20x + 15 = 0$ by completing the square.
15. Complete the square for the equation $x^2 - x = 2$ and solve for x.
16. Complete the square for the equation $x^2 + 2x - 8 = 0$ and find the solutions.
17. Solve the equation $3x^2 - 12x + 9 = 0$ by completing the square.
18. Complete the square for the equation $x^2 - 10x + 21 = 0$ and determine its solutions.
19. Solve the equation $2x^2 + 3x - 2 = 0$ by completing the square.
20. Rewrite the equation $4x^2 - 12x + 5 = 0$ in completed square form and solve for x.

Hard Questions

21. Solve the equation $\frac{1}{2}x^2 + \frac{3}{4}x + \frac{1}{8} = 0$ by completing the square.

22. The area of a square is given by $x^2 + 6x + 9$. Express this area in completed square form and deduce the side length of the square.

23. Solve the equation $6x^2 + 24x + 18 = 0$ by first dividing by 6 and then completing the square.

24. Solve the equation $x^2 + \frac{5}{2}x - \frac{3}{2} = 0$ by completing the square.

25. Rewrite the quadratic equation $7x^2 + 14x + 5 = 0$ in completed square form and solve for x.

26. Complete the square for the quadratic function $f(x) = x^2 - 8x + 15$ and express it in vertex form.

27. Show that the quadratic equation $2x^2 + 4x + c = 0$ has exactly one solution by choosing an appropriate value for c. Rewrite the equation in completed square form to justify your answer.

28. Solve the equation $5x^2 - 20x + 15 = 0$ by completing the square and simplify your answer.

29. Write $x^2 + 7x + 10$ in completed square form and hence determine its solutions.

30. Solve the equation $3x^2 - 11x + 6 = 0$ by rewriting it in completed square form.