ILLAWARRA TUTORING

This worksheet aims to enhance your understanding of special product formulas. You will identify and use identities such as perfect squares and differences of squares to simplify your work.

Easy Questions

1. Expand $(a + b)^2$.

2. Expand $(a - b)^2$.

3. Factorise $a^2 - b^2$.

4. Evaluate $(3 + 2)^2$ by recognising it as a perfect square.

5. Factorise $x^2 - 25$ using special products.

Intermediate Questions

6. Expand $2(x + 3)^2$.

7. Factorise $9y^2 - 16$.

8. Expand $(2x - 3)^2$.

9. Simplify $(x + 5)^2 - (x - 5)^2$.

10. Expand and simplify $(x + 3)^2 - (x - 3)^2$.

11. Factorise $16 - 4y^2$.

12. Expand $(3 + 2x)^2$.

13. Expand $(5x - 7)^2$.

14. Factorise $49 - x^2$.

15. Expand $(2a + 3b)^2$.

16. Factorise $4x^2 - 49$.

17. Expand and simplify $(x + 2)^2 - (x - 2)^2$.

18. Simplify $(3 + x)^2 - (3 - x)^2$.

19. Expand $(x + 1)(x - 1)$ using the difference of squares formula.

20. Factorise $25y^2 - 9$.

Hard Questions

21. Expand and simplify $2(3x - 4)^2 - (x + 1)^2$.

22. Factorise $4(2x + 3)^2 - 9(2x - 1)^2$.

23. Simplify $(x + 2)^2 + (x - 2)^2 - 2(x^2 - 4)$.

24. Expand and simplify $(x + 1)^2 - 2(x - 1)^2 + (x - 3)^2$.

25. Express $(ax + b)^2 - (ax - b)^2$ in its simplest form.

26. Solve $(x + 3)^2 - (x - 1)^2 = 16$ for x.

27. Factorise $49x^2 - 9$. Then, using a suitable diagram, illustrate how the difference of squares formula works.

28. Prove that $(\sqrt{x} + \sqrt{y})^2 - (\sqrt{x} - \sqrt{y})^2 = 4\sqrt{xy}$, and use your result to simplify $(\sqrt{2} + \sqrt{3})^2 - (\sqrt{2} - \sqrt{3})^2$.

29. Factorise completely $9(2 + x)^2 - 16(2 - x)^2$.

30. Expand and simplify $(3x + 2)^2 - (3x - 2)^2 + x^2 - 4$.