ILLAWARRA TUTORING

This worksheet will develop your understanding of special product formulas. You will learn to identify and use formulas such as the perfect square and the difference of two squares to simplify problems. Remember to show all working and to justify each step where necessary.

Easy Questions

1. Expand $(a+b)^2$.
2. Expand $(3x+5)^2$.
3. Factorise x^2-9.
4. Factorise $4y^2-25$.
5. Factorise x^2+6x+9.

Intermediate Questions

6. Expand $(x-7)^2$.
7. Expand $(2a+3b)^2$.
8. Expand $(5p-2q)^2$.
9. Write the expansion of $(x+4)(x-4)$.
10. Factorise x^2-16.
11. Expand $(3x+2)^2$.
12. Express $9m^2-25$ as a product of two binomials.
13. Simplify the expression $(a+b)^2-(a-b)^2$.
14. Simplify $(2x+3)^2-(2x-3)^2$.
15. Factorise $16-4y^2$.
16. Expand $(a+b)^2$ and then factorise your answer.
17. Factorise $49z^2-64$.
18. Verify that $(x+5)^2$ expands to $x^2+10x+25$.

19. Expand $(3x+4)(3x-4)$.
20. Expand $(2y+1)^2$ and then write the expression $4y^2-1$ as a product of binomials.

Hard Questions

21. Prove that $(a+b)^2-(a-b)^2=4ab$.
22. Expand $(2x-3y)^2$ completely.
23. Factorise $49-9k^2$.
24. Show that $9x^2-24xy+16y^2$ is a perfect square.
25. Expand $(5x+2)^2$ and then factorise the result back into its binomial square form.
26. Expand $(3a-2b)(3a+2b)$ and simplify the result.
27. Show that $(x+6)^2-(x-6)^2$ simplifies to $24x$.
28. Simplify $\dfrac{(x+2)^2-(x-2)^2}{4}$.
29. Factorise $64y^2-81$.
30. Solve for x given that $9x^2-24x+16=0$ by first factorising the quadratic as a perfect square.