ILLAWARRA TUTORING

In this worksheet you will learn to identify and use special product formulas, such as perfect squares and differences of squares, to simplify your work. You will expand and factorise quadratic expressions using these formulas.

Easy Questions

1. Expand the expression $(a+b)^2$.
2. Expand $(a-b)^2$.
3. Factorise $a^2 - b^2$.
4. Expand $(3+x)^2$.
5. Expand $(2x-5)^2$.

Intermediate Questions

6. Expand $(3x+4)^2$.
7. Expand $(x-6)^2$.
8. Factorise $9p^2 - q^2$.
9. Expand $(2a-5b)^2$.
10. Factorise $16r^2 - 9s^2$.
11. Expand $(5+2x)^2$.
12. Factorise $4t^2 - 49$.
13. Expand $(3y-7)^2$.
14. Expand $(4m-3n)^2$.
15. Factorise $25z^2 - 1$.
16. Expand $(x+5)^2$.
17. Simplify $(a+b)^2 - (a-b)^2$.
18. Expand and simplify $(x+2)^2 - (x-2)^2$.
19. Factorise $s^2 - 4t^2$.
20. Factorise $49 - c^2$.

Hard Questions

21. Prove that $(a+b)^2 + (a-b)^2 = 2\big(a^2 + b^2\big)$.

22. Simplify $\dfrac{(x+5)^2 - (x-5)^2}{10x}$.

23. Prove that $(a+b)^2 - (a-b)^2 = 4ab$.

24. Show that for any numbers x and y, $(x+y)^2 - (x-y)^2 = 4xy$.

25. Factorise $(2a+3b)^2 - (2a-3b)^2$.

26. Explain why $(x+3)^2 - (x-3)^2 = 12x$ holds for all x.

27. The area of a large square is given by $(x+2)^2$ and that of a small square is given by $(x-2)^2$.

28. Simplify $(3x+4)^2 - (3x-4)^2$.

29. If $(a+2b)^2 - (a-2b)^2 = k\,ab$, find the value of k.

30. Prove that $(x+1)^2 - (x-1)^2 = 4x$ without expanding fully.