ILLAWARRA TUTORING

This worksheet aims to develop your understanding of perfect square trinomials. You will practise factorising and expanding expressions that are perfect squares. Each question is designed to consolidate your skills in recognising and manipulating perfect squares.

## Easy Questions

1. Expand $(x + y)^2$.
2. Factorise $a^2 - 2a + 1$.
3. Expand $(2x - 3)^2$.
4. Factorise $4z^2 + 12z + 9$.
5. Expand $(3m + 4)^2$.

## Intermediate Questions

6. Expand $(2a + 3)^2$.
7. Factorise $9t^2 - 12t + 4$.
8. Expand $\left(p - \frac{7}{3}\right)^2$.
9. Factorise $4x^2 - 12x + 9$.
10. Expand $(3y - 5)^2$.
11. Factorise $16z^2 + 24z + 9$.
12. Expand $(5w + 2)^2$.
13. Factorise $x^2 - 10x + 25$.
14. Expand $(7 - 3b)^2$.
15. Factorise $25a^2 - 20a + 4$.
16. Expand $(2c + 8)^2$.
17. Factorise $49m^2 - 14m + 1$.
18. Expand $(4d - 3)^2$.
19. Factorise $36k^2 + 24k + 4$.
20. Expand $(x - 9)^2$.

## Hard Questions

21. Factorise $x^4 + 2x^2y^2 + y^4$.
22. Find the constant $k$ for which $4x^2 + kx + 9$ is a perfect square.
23. If $(ax + b)^2 = 49x^2 + 28x + 4$, find the values of $a$ and $b$.
24. Write $16y^2 - 24y + 9$ as a perfect square.
25. Determine if $25x^2 - 30x + 9$ is a perfect square and justify your answer.
26. Given $(x + p)^2 = x^2 + 14x + 49$, determine the value of $p$.
27. Express $x^2 - 6x + 9$ as a perfect square and solve $x^2 - 6x + 9 = 0$.
28. Prove that $x^2 + 2xy + y^2$ is a perfect square.
29. Expand $(x - 3)^2$ and then re-factorise your result to recover the vertex form.
30. If $(2x + q)^2 = 4x^2 + 12x + 9$, determine the value of $q$.