ILLAWARRA TUTORING

In this worksheet you will master the laws of indices so that you can simplify expressions involving powers easily. Read each instruction carefully and show all necessary working.

## Easy Questions

1. Simplify $7^3 \times 7^2$.
2. Simplify $\dfrac{9^5}{9^2}$.
3. Simplify $\left(3^2\right)^3$.
4. Simplify $(2 \times 5)^2$ and express it as a product of individual powers.
5. Simplify $2^3 \times 2^2 \times 2^4$.

## Intermediate Questions

6. Simplify $3^4 \times 2^4$ by writing it as a single power.
7. Simplify $\dfrac{2^3 \times 2^5}{2^4}$.
8. Express $\left(a^2b^3\right) \times \left(a^3b^2\right)$ as a single product of powers.
9. Rewrite $(ab)^3$ in the form $a^3 \times b^3$.
10. Simplify $\left(2a^2\right)^3$.
11. Simplify $\dfrac{x^7}{x^3}$.
12. Simplify $\left(x^2\right)^5$.
13. Simplify $\left(3a^3b^2\right)^2$.
14. Simplify $\dfrac{\left(2x^2\right)^3}{2^3}$.
15. Simplify $\dfrac{(3x)^4}{3^2}$.

16. Simplify $(2a \times 3a)^2$.

17. Simplify $\left(2a^3\right)^2 \times a^4$.

18. Simplify $\dfrac{(4a^2b)^3}{(2ab^2)^2}$.

19. Simplify $\left(5xy^2\right)^3 \times \left(2x^2y\right)^2$.

20. Simplify $\dfrac{(x^2y)^3}{(xy^2)^2}$.

## Hard Questions

21. Simplify $\dfrac{(2a^2b^3)^4}{(4a^3b)^2}$.

22. Simplify $\dfrac{(3x^2y)^3}{(9xy^2)^2}$.

23. Simplify $\left(a^3b^2\right)^2 \times \left(a^2b\right)^3$.

24. Simplify $\dfrac{(2xy)^5}{(4x^3y^2)^2}$.

25. Simplify $\dfrac{(ab^2)^3 \times (a^2b)^2}{(ab)^4}$.

26. Simplify $\left(\dfrac{2a^2b}{3ab^2}\right)^3$.

27. Simplify $\left(2x^2y^3z\right)^2 \times \left(3xy^2z^3\right)^2$.

28. Simplify $\dfrac{(6x^3y^2)^2}{(3x^2y)^3}$.

29. Simplify $\dfrac{(5a^2b^3)^3 \times (2a^3b)^2}{(10a^5b^4)^2}$.

30. Simplify $\dfrac{(4a^2b)^3}{(2ab)^4}$.