ILLAWARRA TUTORING

This worksheet focuses on solving exponential equations by applying logarithms to isolate the unknown exponent. You will practise rewriting equations in the form $a^{f(x)} = b$, and then taking logarithms to solve for x. Remember to show all steps in your work.

Easy Questions

1. Solve for x. Write your answer in exact form: $2^x = 16$.
2. Solve for x. Write your answer in exact form: $3^x = 27$.
3. Solve for x. Write your answer in exact form: $4^x = 64$.
4. Solve for x. Write your answer in exact form: $5^x = 5$.
5. Solve for x. Write your answer in exact form: $2^{(x+1)} = 8$.

Intermediate Questions

6. Solve for x: $2^x = 7$.
7. Solve for x: $3^{2x} = 81$.
8. Solve for x: $4^{(x-1)} = 16$.
9. Solve for x: $5^{(x+2)} = 125$.
10. Solve for x: $7^x = 50$.
11. Solve for x: $2^{(2x+1)} = 32$.
12. Solve for x: $3^{(x-2)} = 9$.
13. Solve for x: $10^{2x} = 1000$.
14. Solve for x: $2^{(3x)} = 64$.
15. Solve for x: $4^{(2x)} = 256$.
16. Solve for x: $6^{(x+1)} = 216$.
17. Solve for x: $5^{(2x-1)} = 625$.
18. Solve for x: $8^x = 20$.
19. Solve for x: $3^{(x+2)} = 27$.
20. Solve for x: $2^x = 5$.

Hard Questions

21. Solve for x: $2^{(2x)} = 3^{(x+1)}$.
22. Solve for x: $3^{(x+3)} = 2^{(2x-1)}$.
23. Solve for x: $5^{(2x+1)} = 3^{(x-2)}$.
24. Solve for x: $4^x = 2^{(3x-4)}$.
25. Solve for x: $7^{(x-1)} = 2^{(x+2)}$.
26. Solve for x: $2^{(x+2)} = 3^{(2x-1)}$.
27. Solve for x: $5^{(x-3)} = 4^{(2x+1)}$.
28. Solve for x: $6^{(3x+2)} = 7^{(x-1)}$.
29. Solve for x: $3^{(2x)} = 5^{(x+3)}$.
30. Solve for x: $2^x \cdot 3^x = 24$.