Extra Practice

Math 10 · Mr. Merrick · September 17, 2025

1. $12^{2x+1} = 2^{3x+7} \cdot 3^{3x-4}$

2. If $x^3y^5 = 2^{11}3^{13}$ and $\dfrac{x}{y^2} = \dfrac{1}{27}$, find x and y.

3. $y = ax^r$ passes through $(2, 1)$ and $(32, 4)$. Find r.

4. Solve for x and y: $2^{x+3} + 2^x = 3^{y+2} - 3^y$

5. If $f(x) = 2^{4x-2}$, find $f(x) \cdot f(1-x)$ in simplest form.

6. Solve for x and y: $3^{x+2} + 2^{x+2} + 2^x = 2^{x+5} + 3^x$

7. Solve for x: $5^{x-1} = 125 \cdot 25^x$

8. If $p^2q^3 = 2^6 \cdot 3^9$ and $\dfrac{p}{q} = 6$, find p and q. Answer in positive index form.

9. The function $y = k \cdot a^x$ passes through $(0, 3)$ and $(2, 12)$. Find a.

10. $7^{m+1} - 7^m = 6 \cdot 7^2$. Solve for m.

11. If $g(x) = 3^{2x+1}$, compute $\dfrac{g(x+1)}{g(x-1)}$.

12. Solve for integers x, y: $2^x + 2^y = 10$.

13. If $h(x) = \dfrac{4^x + 2^{2x}}{8^x}$, simplify $h(x)$.

14. Solve for x: $9^{x-1} \cdot 3^{2x} = 81$.

15. If $y = ab^x$ passes through $(1, 6)$ and $(3, 54)$, find a and b.

16. Suppose $2^p = 3^q$. Express p in terms of q using logarithms.

17. Solve for x: $4^{x+2} = 2^{3x}$.

18. If $M = 2^5 3^4$ and $N = 2^2 3^6$, find $\dfrac{M}{N}$ in simplest form.

19. Evaluate $\left(27\right)^{-2(3^{-1})}$.

20. Solve for x: $\left(\dfrac{5}{8}\right)^x \left(\dfrac{25}{64}\right)^2 = \dfrac{5}{8}$

21. Order 4^{40}, 3^{50}, 2^{80} from least to greatest.

22. If $a = 9^{12}$ and $b = 12^9$, which is larger?

23. Evaluate $\left(81\right)^{-3(4^{-1})}$.

24. Solve for x: $\left(\dfrac{7}{9}\right)^x \left(\dfrac{49}{81}\right)^3 = \dfrac{7}{9}$

25. Order 6^{20}, 3^{30}, 2^{60} from least to greatest.

26. Evaluate $\left(125\right)^{-4(3^{-1})}$.

27. Which is larger: 7^{12} or 14^9?