

Exponents Review

Product Law

Supply a Simplified Expression in Exponential Form

MILD

1. $3^2 \cdot 3^5$

2. $7^4 \cdot 7^3$

3. $2^3 \cdot 2^4 \cdot 2^2$

MEDIUM

4. $x^3 \cdot x^5$

5. $3x^2(4x^5)$

6. $2x^3y(5x^2y^4)$

SPICY

7. $(3x^2y^3)(4x^5y^2)$

8. $(-2a^3b^2)(5a^4b^5)$

9. $(-4x^2y^3)(-3x^5y^4)$

Quotient Law

Supply a Simplified Expression in Exponential Form

MILD

10. $\frac{5^7}{5^3}$

11. $\frac{3^9}{3^4}$

12. $\frac{8^{12}}{8^5}$

MEDIUM

13. $\frac{x^9}{x^4}$

14. $\frac{12x^7}{3x^2}$

15. $\frac{18x^6y^5}{6x^2y^3}$

SPICY

16. $\frac{24x^8y^6}{6x^3y^2}$

17. $\frac{35a^9b^7}{5a^4b^3}$

18. $\frac{48x^{10}y^8z^5}{8x^4y^3z^2}$

Chain Law

Expand Each Statement Using the Chain Law

MILD

19. $(3^2)^4$

20. $(5^3)^2$

21. $(x^3)^4$

MEDIUM

22. $(2x^3)^2$

23. $(3x^2y)^3$

24. $(4a^3b^2)^2$

SPICY

25. $(2x^3y^2)^4$

26. $(-3a^2b^4)^3$

27. $(-2x^4y^3z^2)^3$

Product, Quotient & Chain Laws

Simplify Each Expression

MILD

28. $\frac{2^3 \cdot 2^5}{2^4}$

29. $(3^2 \cdot 3^4)^2$

30. $\frac{(5^3)^2}{5^4}$

MEDIUM

31. $\frac{(x^3)^2 x^4}{x^5}$

32. $\frac{(2x^2)^3}{4x^2}$

33. $\frac{3x^4(2x^3)}{6x^2}$

SPICY

34. $\frac{(3x^2y^3)^2}{9x^3y^2}$

35. $\frac{(2a^3b^2)^3}{4a^4b^3}$

36. $\frac{(4x^2y^3)^2(2x^3y)}{8x^4y^2}$

Exponent Law Problems

Simplify each answer in exponential form.

MILD

1. A rectangular garden has a length of $4x^3$ metres and a width of $2x^2$ metres. Determine the area of the garden.
2. A square patio has a side length of $3x^2$ metres. Determine the area of the patio.
3. A rectangle has an area of $18x^7 \text{ cm}^2$ and a length of $3x^2 \text{ cm}$. Determine its width.
4. A machine processes $20x^6$ kilograms of material in $5x^2$ hours. Determine the rate at which the machine processes material.
5. A rectangular prism has dimensions $2x$, $3x^2$, and $4x^3$ centimetres. Determine its volume.
6. A rectangle has a length of $5x^2y^3$ metres and a width of $3x^4y$ metres. Determine its area.

MEDIUM

7. A cube has an edge length of $2x^3$ centimetres. Determine its volume.
8. A square image has a side length of x^2 centimetres. Each side is enlarged by a scale factor of 3. Determine the area of the enlarged image.
9. A rectangle has an area of $28x^9y^5 \text{ m}^2$ and a width of $4x^3y^2 \text{ m}$. Determine its length.
10. A cube has an edge length of $2x^3y^2$ centimetres. Determine its volume.
11. A rectangular field has a length of $6a^4b^3c$ metres and a width of $5a^2b^5c^4$ metres. Determine its area.

SPICY

13. A square-based prism has a base edge of $2x^2$ centimetres and a height of $5x^3$ centimetres. Determine its volume.
14. A rectangle has an area of $54x^{12}y^9z^5 \text{ cm}^2$ and a width of $6x^4y^3z^2 \text{ cm}$. Determine its length.
15. A square plot has an original side length of $2x^3$ metres. Each side is enlarged by a scale factor of $3x$. Determine the area of the enlarged plot.
16. A rectangular prism has dimensions x^2 , $3x$, and $2x^3$ centimetres. Every dimension is enlarged by a scale factor of $2x$. Determine the volume of the enlarged prism.
17. A square-based prism has a volume of $108x^{13}y^8 \text{ cm}^3$. Each side of its square base is $3x^2y \text{ cm}$. Determine the height of the prism.