

1. Simplify: $y^3 (y^2y^4)$
2. Simplify: $4x^2 (3x^5)$
3. Simplify: $(-4x^3)(-5x)$
4. Simplify: $(a^3)^7$
5. Simplify: $(2y^3y)^2 (y^2)^2$
6. Simplify: $(-3x^2y^4z)^2$
7. Simplify: $\left(\frac{x^2}{y^3}\right)^5$
8. Simplify: $\left(\frac{-2a}{b}\right)^5$
9. Simplify: $\frac{b^4b^5}{b^2b^3}$
10. Simplify: $\frac{18(x^3y^2)(xy^3)}{6(x^2y^2)(xy^2)}$
11. Simplify: $\frac{20(r^4s^3)^4}{6(rs^3)^3}$
12. Simplify: $\left(\frac{y^3y}{2yy^2}\right)^3$
13. Simplify: x^{-2}
14. Simplify: $(2y)^{-4}$
15. Simplify: $(x^2y^{-3})^{-4}$
16. Simplify: $(m^2n^3)^{-2}$
17. Simplify: $\frac{x^{12}x^{-7}}{x^3x^4}$
18. Simplify: $\left(\frac{x^5}{y^{-2}}\right)^{-2}$
19. Simplify: $\left(\frac{-2x^4x^{-3}}{x^{-3}x^7}\right)^2$
20. Simplify: $\frac{(2x^{-2})^{-2}}{4(x^2y)^{-1}}$
21. Evaluate without using a calculator: $(-27)^{-\frac{2}{3}}$
22. Evaluate without using a calculator: $(8)^{\frac{4}{3}}$
23. Evaluate without using a calculator: $-16^{-\frac{3}{2}}$
24. Evaluate without using a calculator: $-\left(\frac{1}{64}\right)^{\frac{5}{6}}$
25. Simplify: $(a^{-1/2}b)(a^{3/4}b^{1/2})$
26. Simplify: $\frac{z^{1/2}}{z^{1/3}}$
27. Simplify: $\frac{x^{1/2}y^{-2}}{xy^{1/2}}$
28. Simplify: $\left(\frac{48a^6}{27b^8}\right)^{-1/2}$
29. Simplify, then write your answer in scientific notation: $(3.4 \times 10^{-3})(2.1 \times 10^4)$
30. Simplify, then write your answer in scientific notation: $\frac{9.3 \times 10^2}{3.1 \times 10^{-2}}$
31. The distance from Mercury to the sun is approximately 3.6×10^7 miles. Use scientific notation to express this distance in feet. (5280 feet = 1 mile.)