

More Practice (8-3 through 8-5)**“Properties of Exponents”****Simplify each expression.**

1. $a^3 \cdot a$

2. $3^8 \cdot 3^5$

3. $(3p^{-15})(6p^{11})$

4. $r^7 \cdot s^4 \cdot s \cdot r^3$

5. $b^7 \cdot b^{13}$

6. $(7p^4)(5p^9)$

7. $5^{-7} \cdot 5^9$

8. $\frac{1}{h^7 \cdot h^3}$

9. $\frac{1}{t^{-5} \cdot t^{-3}}$

10. $f^5 \cdot f^2 \cdot f^0$

11. $5^{-6} \cdot 5^4$

12. $r^6 \cdot r^{-13}$

Simplify each expression. Write each answer in scientific notation.

13. $(4 \times 10^9)(11 \times 10^3)$

14. $(5 \times 10^{13})(9 \times 10^{-9})$

15. $(7 \times 10^6)(4 \times 10^9)$

Simplify each expression.

16. $x^4 \cdot (x^4)^3$

17. $(x^5 y^3)^3 (xy^5)^2$

18. $(5^2)^2$

19. $(a^4)^{-5} \cdot a^{13}$

20. $(3f^4 g^{-3})^3 (f^2 g^{-2})^{-1}$

21. $x^3 \cdot (x^3)^5$

22. $(y^6)^{-3} \cdot y^{21}$

23. $n^6 \cdot (n^{-2})^5$

24. $(m^5)^{-3} (m^4 n^5)^4$

25. $\frac{m^6}{m^{10}}$

26. $\left(\frac{2^3 m^4 n^{-1}}{p^2}\right)^0$

27. $\left(\frac{s^{-4}}{t^{-1}}\right)^{-2}$

28. $\left(\frac{2a^3 b^{-2}}{c^3}\right)^5$

29. $\left(\frac{x^{-3} y}{xz^{-4}}\right)^{-2}$

30. $\frac{h^{-13}}{h^{-8}}$

31. $\frac{4^6}{4^8}$

32. $\left(\frac{1}{3}\right)^3$

Simplify each quotient. Write each answer in scientific notation.

33. $\frac{9.5 \times 10^9}{5 \times 10^{12}}$

34. $\frac{6.4 \times 10^9}{8 \times 10^7}$

35. $\frac{298 \text{ billion}}{49 \text{ million}}$

36. $\frac{1.8 \times 10^{-8}}{0.9 \times 10^3}$

37. $\frac{3.6 \times 10^6}{9 \times 10^{-3}}$

38. $\frac{8.19 \times 10^7}{4.76 \times 10^{-2}}$

39. $\frac{65 \text{ million}}{19.5 \text{ billion}}$

40. $\frac{4.9 \times 10^{12}}{7 \times 10^3}$