Name _____ Class _____ Date _____

Practice 8-3

Multiplication Properties of Exponents

Simplify each expression.

1. $(3d^{-4})(5d^{8})$

2. $(-8m^{4})(4m^{8})$

3. $n^{-6} \cdot n^{-6}$

4. $p^{7} \cdot q^{5} \cdot p^{6}$

5. $(-1.5a^{5}b^{2})(6a)$

6. $(-2d^{3}e^{3})(6d^{4}e^{6})$

7. $(8d^{4})(4d^{7})$

8. $x^{-9} \cdot x^{3} \cdot x^{2}$

9. $2^{3} \cdot 2^{2}$

10. $2^{8} \cdot 2^{-9} \cdot 2^{3}$

11. $(6r^{4}s^{3})(9rs^{2})$

12. $4^{3} \cdot 4^{2}$

13. $5^{-7} \cdot 5^{9}$

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

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

Simplify each expression. Write each answer in scientific notation.

16. $(7 \times 10^{7})(5 \times 10^{-5})$

17. $(3 \times 10^{8})(3 \times 10^{4})$

18. $(9.5 \times 10^{-4})(2 \times 10^{-5})$

19. $(6 \times 10^{-6})(5.2 \times 10^{4})$

20. $(4 \times 10^{6})(9 \times 10^{8})$

21. $(6.1 \times 10^{9})(8 \times 10^{14})$

22. $(4 \times 10^{9})(11 \times 10^{3})$

23. $(5 \times 10^{13})(9 \times 10^{-9})$

24. $(7 \times 10^{6})(4 \times 10^{9})$

25. In 1990, the St. Louis metropolitan area had an average of 82×10^{-6} g/m^3 of pollutants in the air. How many grams of pollutants were there in 2×10^{3} m^3 of air?

26. Light travels approximately 5.8×10^{12} mi in one year. This distance is called a light-year. Suppose a star is 2×10^{4} light-years away. How many miles away is that star?

27. Light travels 1.18×10^{10} in. in 1 second. How far will light travel in 1 nanosecond or 1×10^{-9} s?