Name _____ Class _____ Date _____

Practice 8-4

More Multiplication Properties of Exponents

Simplify each expression.

1. $(4a^5)^3$
2. $(2^{-3})^4$
3. $(m^{-3}n^4)^{-4}$
4. $(x^5)^2$
5. $2^5 \cdot (2^4)^2$
6. $(4x^4)^3(2xy^3)^2$
7. $x^4 \cdot (x^4)^3$
8. $(x^5y^3)^3(xy^5)^2$
9. $(5^2)^2$
10. $(a^4)^{-5} \cdot a^{13}$
11. $(3f^4g^{-3})^3(f^2g^{-2})^{-1}$
12. $x^3 \cdot (x^3)^5$
13. $(d^2)^{-4}$
14. $(a^3b^4)^{-2}(a^{-3}b^{-5})^{-4}$
15. $(x^2y)^4$
16. $(12b^{-2})^2$
17. $(m^{-5})^{-3}$
18. $(x^{-4})^5(x^3y^2)^5$
19. $(y^6)^{-3} \cdot y^{21}$
20. $n^6 \cdot (n^{-2})^5$
21. $(m^5)^{-3}(m^4n^5)^4$
22. $(a^3)^6$
23. $b^{-9} \cdot (b^2)^4$
24. $(4^{-1}s^3)^{-2}$
25. $(5a^3b^5)^4$
26. $(b^{-3})^6$
27. $(y^6)^3$
28. $a^{-4} \cdot (a^4b^3)^2$
29. $(x^4y)^3$
30. $d^3 \cdot (d^2)^5$

Simplify. Write each answer in scientific notation.

31. $10^{-9} \cdot (2 \times 10^2)^2$
32. $(3 \times 10^{-6})^3$
33. $10^4 \cdot (4 \times 10^6)^3$
34. $(9 \times 10^7)^2$
35. $10^{-3} \cdot (2 \times 10^3)^5$
36. $(7 \times 10^5)^3$
37. $(5 \times 10^5)^4$
38. $(2 \times 10^{-3})^3$
39. $(5 \times 10^2)^{-3}$
40. $(3 \times 10^5)^4$
41. $(4 \times 10^8)^{-3}$
42. $(1 \times 10^{-5})^{-5}$
43. $10^5 \cdot (8 \times 10^7)^3$
44. $(10^2)^3(6 \times 10^{-3})^3$
45. $10^7 \cdot (2 \times 10^2)^4$

46. The kinetic energy, in joules, of a moving object is found by using the formula $E = \frac{1}{2}mv^2$, where m is the mass and v is the speed of the object. The mass of a car is 1.59×10^3 kg. The car is traveling at 2.7×10^1 m/s. What is the kinetic energy of the car?

47. The moon is shaped somewhat like a sphere. The surface area of the moon is found by using the formula $S = 12.56r^2$. What is the surface area of the moon if the radius is 1.08×10^3 mi?

48. Because of a record corn harvest, excess corn is stored on the ground in a pile. The pile is shaped like a cone. The height of the pile is 25 ft, and the radius of the pile is 1.2×10^2 ft. Use the formula $V = \frac{1}{3}\pi r^2 h$ to find the volume.

49. Suppose the distance in feet that an object travels in t seconds is given by the formula $d = 64t^2$. How far would the object travel after 1.5×10^3 seconds?