

CHAPTER TEST

CHAPTER

4

Simplify.

1. 10^9 **1,000,000,000** 2. 11^{-3} **$\frac{1}{1331}$** 3. 2^7 **128** 4. 3^{-4} **$\frac{1}{81}$**

Simplify each expression. Write your answer in exponential form.

5. $\frac{3^3}{3^6}$ **$\frac{1}{3^3}$** 6. $7^9 \cdot 7^2$ **7^{11}** 7. $(5^{10})^6$ **5^{60}** 8. $\frac{11^{-7}}{11^7}$ **$\frac{1}{11^{14}}$**
 9. $27^3 \cdot 27^{-18}$ **$\frac{1}{27^{15}}$** 10. $(52^{-7})^{-3}$ **52^{21}** 11. $13^0 \cdot 13^9$ **13^9** 12. $\frac{8^{12}}{8^7}$ **8^5**

Simplify each expression.

13. $(-4a)^3$ **$-64a^3$** 14. $(7y^4)(-9y^5)$ **$-63y^9$** 15. $\frac{72mn^2}{-8mn}$ **$-9n$**
 16. $(12pq^7)(\frac{2}{3}q^2)$ **$8pq^9$** 17. $\frac{12a^8b^3}{9a^5}$ **$\frac{4}{3}a^3b^3$** 18. $(-5x^3y)^2$ **$25x^6y^2$**

Write each number in standard form.

19. 4.257×10^5 **425,700** 20. 4.8×10^8 **480,000,000** 21. 6.09×10^{-3} **0.00609** 22. 3.5×10^{-4} **0.00035**

Write each number in scientific notation.

23. 19,000,000,000 24. 0.0000039 25. $1,980,000,000$ **1.98×10^9** 26. 0.00045 **4.5×10^{-4}**
 27. Order 3.7×10^5 , 3.7×10^6 , 3.7×10^{-5} , and 3.7×10^{-6} from least to greatest. **3.7×10^{-6} , 3.7×10^{-5} , 3.7×10^5 , 3.7×10^6** 23. **1.9×10^{10}**
 24. **3.9×10^{-6}**

Find the two square roots of each number.

28. 196 **± 14** 29. 1 **± 1** 30. 225 **± 15** 31. 625 **± 25**

32. The area of a square rug is 144 square feet. What is the length of the rug? **12 ft**

Simplify each expression.

33. $\sqrt{y^4}$ **y^2** 34. $\sqrt{121s^8}$ **$11s^4$** 35. $\sqrt{9y^6}$ **$3|y^3|$** 36. $\sqrt{25m^2}$ **$5|m|$**

Each square root is between two consecutive integers. Name the integers. Explain your answer.

37. $\sqrt{230}$ **15 and 16** 38. $\sqrt{125}$ **11 and 12** 39. $-\sqrt{60}$ **-7 and -8** 40. $-\sqrt{3}$ **-1 and -2**

Write all classifications that apply to each number.

41. $-\sqrt{121}$ **integer, rational, real** 42. $-1.\bar{7}$ **rational, real** 43. $\frac{7}{0}$ **not a real number** 44. $\frac{\sqrt{225}}{3}$ **whole number, integer, rational, real**

Find the missing length for each right triangle.

45. $a = 10$, $b = 24$, $c = \square$ **26** 46. $a = \square$, $b = 15$, $c = 17$ **8** 47. $a = 12$, $b = \square$, $c = 20$ **16**

Tell whether the given side lengths form a right triangle.

48. 8, 10, 14 **no** 49. 30, 40, 50 **yes** 50. 2.5, 6, 6.5 **yes**