

8.5 Practice



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▶ Review & Refresh

Simplify. Write the expression using only positive exponents.

1. $3x^{-5}$

2. $d^0 \cdot d^{-4}$

3. $\frac{a^6}{2a^{11}}$

Write an equation in point-slope form of the line that passes through the given point and has the given slope.

4. $(-1, 2); m = -\frac{1}{3}$

5. $(3, 4); m = \frac{3}{4}$

6. $(1, -4); m = -2$

▶ Concepts, Skills, & Problem Solving

APPROXIMATING NUMBERS Match the number with its closest approximation.

(See Exploration 2, p. 343.)

7. 0.000618

8. 7,257,993,201

9. 0.0006781004

10. 782,309,441

A. 8×10^8

B. 6×10^{-4}

C. 7×10^{-4}

D. 7×10^9

APPROXIMATING A LARGE NUMBER Round the number. Write the result as a product of a single digit and a power of 10.

11. 414,148,636,008

12. 231,210

13. 28,007,806,203

14. 38,108,996,999

15. 1,003,111,391,008

16. 627,638,538



17. **APPROXIMATING A LARGE NUMBER** A company earns \$518,204,500. Round the number. Write the result as a product of a single digit and a power of 10.

APPROXIMATING A SMALL NUMBER Round the number. Write the result as a product of a single digit and a power of 10.

18. 0.00000124

19. 0.00003946

20. 0.00001726

21. 0.00063718

22. 0.00000000305

23. 0.000000000994

24. **MP YOU BE THE TEACHER** Your friend rounds 0.000468 to the nearest ten thousandth and writes the result as a product of a single digit and a power of 10. Is your friend correct? Explain your reasoning.

$$\begin{aligned} 0.000468 &\approx 0.0005 \\ &= 5 \times 0.0001 \\ &= 5 \times 10^{-4} \end{aligned}$$

25. **APPROXIMATING A QUANTITY** A series of mystery books contains 2,029,242 words. A series of science fiction books contains about 3.5 times the number of words as the mystery book series. What is the approximate number of words in the science fiction book series?

26. **APPROXIMATING A QUANTITY** A volcanic eruption ejects about 43,600,000,000 cubic feet of volcanic rock. A smaller volcanic eruption ejects about 75% of this amount. What is the approximate amount of volcanic rock that the smaller volcanic eruption ejects?



27. **MP STRUCTURE** Find a number that is approximately 1.5 times 61,040,000,100. Write the result as the product of a single digit and a power of 10.



Mitochondrion

28. **APPROXIMATING A QUANTITY** A mitochondrion has a diameter of about 0.00000031 meter. The diameter of a chloroplast is about 3 times that of the mitochondrion. What is the approximate diameter of the chloroplast?

29. **MP MODELING REAL LIFE** A photo taken with a smartphone has 1,227,104 pixels. A photo taken with a camera has 11,943,936 pixels. Approximately how many times more pixels are in the photo taken with the camera?

30. **MP MODELING REAL LIFE** A star has a core temperature of about 115,000,000°F. The temperature of a lightning strike is about 10,300°F. Approximately how many times hotter is the core temperature of the star than the temperature of the lightning strike?

31. **MP REASONING** The table shows the diameters of five types of animal hairs.

Animal	Buffalo	Rat	Camel	Cow	Donkey
Diameter (meter)	0.00011	0.00004	0.00008	0.00016	0.00005

- Order the hair types from greatest to least diameter.
- What unit should be used to represent these data? Explain your reasoning.

32. **MP PROBLEM SOLVING** The distance between New York City and Princeton is about 68,500 meters. The distance between New York City and San Antonio is about 40 times this distance. What is the approximate distance between New York City and San Antonio? Write the result as the product of a single digit and a power of 10.

33. **MP REASONING** Is 5×10^6 a better approximation of 5,447,040 or 5,305,004? Explain.

34. **MP NUMBER SENSE** A proton weighs 0.0000000000167 nanogram. About how much do 8 protons weigh? Write the result as the product of a single digit and a power of 10. Is your answer an overestimate or an underestimate?