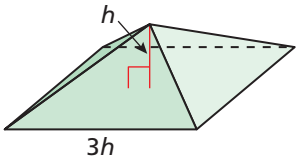
42. **COLLEGE PREP** Which of the expressions represent the volume of the square pyramid, where s is the side length of the base and h is the height of the pyramid? Select all that apply.



Ⓐ h^3 Ⓑ $3h^3$

Ⓒ $\frac{1}{3^{-1}h^{-3}}$ Ⓓ $\frac{1}{3h^{-3}}$

Ⓔ $\left(\frac{3}{s}\right)^{-3}$ Ⓕ $\frac{s^3}{9}$

In Exercises 43–46, simplify the expression. Write your answer using only positive exponents.

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

44. $\left(\frac{4s^5t^{-7}}{-2s^{-2}t^4}\right)^3$

45. $\left(\frac{3m^{-5}n^2}{4m^{-2}n^0}\right)^2 \cdot \left(\frac{mn^4}{9n}\right)^2$

46. $\left(\frac{3x^3y^0}{x^{-2}}\right)^4 \cdot \left(\frac{y^2x^{-4}}{5xy^{-8}}\right)^3$

In Exercises 47–50, evaluate the expression. Write your answer in scientific notation and in standard form.

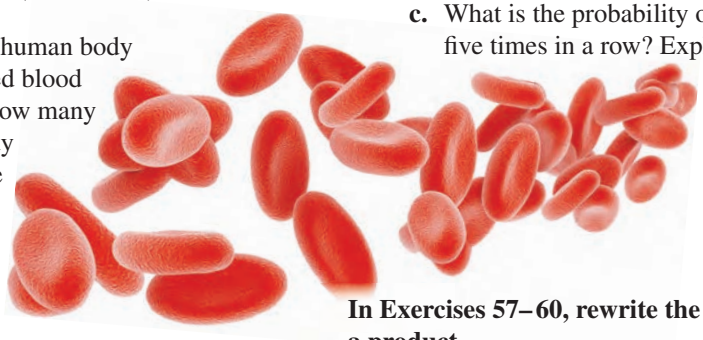
47. $(3 \times 10^2)(1.5 \times 10^{-5})$

48. $(6.1 \times 10^{-3})(8 \times 10^9)$

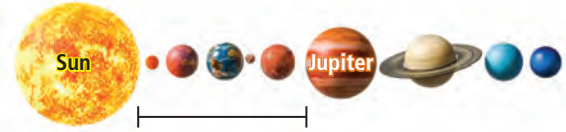
49. $\frac{(6.4 \times 10^7)}{(1.6 \times 10^5)}$

50. $\frac{(3.9 \times 10^{-5})}{(7.8 \times 10^{-8})}$

51. **MODELING REAL LIFE** The human body produces about 4.8×10^6 red blood cells in 4×10^{-2} minute. How many red blood cells does the body produce each minute? Write your answer in scientific notation and in standard form. *Example 6*



52. **MODELING REAL LIFE** The speed of light is approximately 3×10^5 kilometers per second. How long does it take sunlight to reach Jupiter? Write your answer in scientific notation and in standard form.



Average Distance: 7.8×10^8 kilometers

53. MP **NUMBER SENSE** Without evaluating, order $(7 \cdot 7)^5$, $(7 \cdot 7)^{-8}$, and $(7 \cdot 7)^0$ from least to greatest. Explain your reasoning.

54. MP **STRUCTURE** Without evaluating, rewrite $\frac{3^{10} \cdot 27^9}{9^{12}}$ as a single power with base 3.

55. MP **PROBLEM SOLVING** A byte is a unit used to measure a computer's memory. The table shows the numbers of bytes in several units of measure.

Unit	kilobyte	megabyte	gigabyte	terabyte
Number of bytes	2^{10}	2^{20}	2^{30}	2^{40}

a. How many kilobytes are in 1 terabyte? Write your answer as a power.

b. How many megabytes are in 16 gigabytes? Write your answer as a power.

c. Another unit used to measure a computer's memory is a bit. There are 8 bits in a byte. How can you convert the number of bytes in each unit of measure given in the table to bits? Can you still use a base of 2? Explain.

56. MP **STRUCTURE** The probability of rolling a 6 on a number cube is $\frac{1}{6}$. The probability of rolling a 6 twice in a row is $\left(\frac{1}{6}\right)^2 = \frac{1}{36}$.

a. Write an expression that represents the probability of rolling a 6 n times in a row.

b. What is the probability of rolling a 6 four times in a row?

c. What is the probability of flipping heads on a coin five times in a row? Explain.

In Exercises 57–60, rewrite the expression as a power of a product.

57. $8a^3b^3$

58. $16r^2s^2$

59. $64w^{18}z^{12}$

60. $81x^4y^8$

61. MP **STRUCTURE** Find the value of each missing exponent.

$$\left(\frac{p^5q^7r^2}{p^{-2}qr^6}\right)^{\square} = \frac{r^{12}}{p^{21}q^{\square}}$$