

**Practice  
4-5**

**Problem Solving**

1. A star is  $3.822 \times 10^{16}$  miles from Earth. Express this distance in scientific notation using an appropriate unit from the given list. What is the most appropriate unit for expressing the distance from Earth? How far from Earth is the star? If necessary, fill in the answer to complete your choice.

1 light-year $\approx 5.88 \times 10^{12}$ miles
1 mile = 5,280 feet
1 foot = 12 inches

- A. The most appropriate unit is the inch. The star is \_\_\_\_\_ inches from Earth.
  - B. The most appropriate unit is the foot. The star is \_\_\_\_\_ feet from Earth.
  - C. The most appropriate unit is the light-year. The star is \_\_\_\_\_ light-years from Earth.
  - D. The most appropriate unit is the mile. The distance in miles is given.
2. What is the value of  $n$  in the equation  $1.9 \times 10^7 = (1 \times 10^5)(1.9 \times 10^n)$ ?
3. A whale has a mass of  $1.3 \times 10^5$  kilograms. Express the mass in scientific notation using an appropriate unit from the given list.

1 metric ton = $1 \times 10^3$ kilograms
1 kilogram $\approx 2.2$ pounds
1 kilogram = $1 \times 10^4$ decigrams

What is the most appropriate unit for expressing the mass? What is the mass of the whale? If necessary, fill in the answer to complete your choice.

- A. The most appropriate unit is the metric ton. The mass of the whale is \_\_\_\_\_ metric tons.
- B. The most appropriate unit is the decigram. The mass of the whale is \_\_\_\_\_ decigrams.
- C. The most appropriate unit is the pound. The mass of the whale is \_\_\_\_\_ pounds.
- D. The most appropriate unit is the kilogram. The mass of the whale in kilograms is given.

4. Two stars are  $9.996 \times 10^{16}$  miles apart. Express this distance in scientific notation using an appropriate unit from the given list. What is the most appropriate unit for expressing the distance between the two stars? How far apart are the two stars? Select the correct choice below. If necessary, fill in the answer to complete your choice.

1 mile $\approx$ 1,609 meters
1 kilometer = 1,000 meters
1 light-year $\approx$ $5.88 \times 10^{12}$ miles

- A. The most appropriate unit is the meter. The stars are \_\_\_\_\_ meters apart.
- B. the most appropriate unit is the kilometer. The stars are \_\_\_\_\_ kilometers apart.
- C. The most appropriate unit is the light-year. The stars are \_\_\_\_\_ light-years apart.
- D. The most appropriate unit is the mile. The distance in miles is given.
5. The depth of the deepest part of a body of water is 190,080 inches. Express this depth in scientific notation using an appropriate unit from the given list. What is the most appropriate unit for expressing the depth? What is the depth? Select the correct choice below. If necessary, fill in the answer to complete your choice.

1 centimeter = 10 millimeters
1 meter = 100 centimeters
1 inch = 2.54 centimeters

- A. The most appropriate unit is the centimeter. The depth is \_\_\_\_\_ centimeters.
- B. The most appropriate unit is the meter. The depth is \_\_\_\_\_ meters.
- C. The most appropriate unit is the millimeter. The depth is \_\_\_\_\_ millimeters.
- D. The most appropriate unit is the inch. The depth in inches is given.
6. For the equation  $4.2 \times 10^6 = (6 \times 10^n)(7 \times 10^3)$ , your friend incorrectly says the value of  $n$  is 3.
- a) What is the correct value of  $n$ ?
- b) What was your friend's likely error?
- A. He solved the equation  $6 \div n = 3$ .
- B. He solved the equation  $3n = 6$ .
- C. He solved the equation  $n + 3 - 1 = 6$ .
- D. He solved the equation  $n + 3 = 6$ .

7. a) What is the value of  $n$  in the equation  $1.5 \times 10^{12} = (5 \times 10^5)(3 \times 10^n)$ ?

b) Explain why the exponent on the left side of the equation is not equal to the sum of the exponents on the right side.

8. What is the value of  $n$ ?

$$4.2 \times 10^n = (3 \times 10^5)(1.4 \times 10^7)$$

9. **Think About the Process** The speed of sound is about 13,504 inches per second. Use the conversion  $1 \text{ meter} \approx 39.37 \text{ inches}$ .

a) Express the speed of sound using scientific notation to complete the following sentence.

The speed of sound is about \_\_\_\_\_ meters per second, \_\_\_\_\_ centimeters per second, and \_\_\_\_\_ millimeters per second.

b) What is the most appropriate way to express the speed of sound?

- A. Millimeters per second
- B. Centimeters per second
- C. Meters per second

c) How many minutes does it take to hear a sound 12,348 meters, 1,234,800 centimeters, and 12,348,000 millimeters away?

10. **Think About the Process** You are given the following equation.

$$1.8 \times 10^n = (6 \times 10^8)(3 \times 10^6)$$

a) Which equation relates the value of  $n$  to the other two exponents?

- A.  $6 = n + 8$
- B.  $n = 1 + 8 + 6$
- C.  $18 = 8 + n - 1$
- D.  $n = 8 + 6 - 1$

b) What is the value of  $n$ ?

1. C,  $6.5 \times 10^3$
2. 2
3. A,  $1.3 \times 10^2$
4. C,  $1.7 \times 10^4$
5. B,  $4.828032 \times 10^3$
6. a) 2  
b) D
7. a) 6  
b) Answers will vary
8. 12
9. a)  $3.43 \times 10^2$   
 $3.43 \times 10^4$   
 $3.43 \times 10^5$   
b) C  
c) 0.6
10. a) B  
b) 15