Name KEY Date _____ Class 1ST Qtrly

SECTION 3.3 CONVERSION PROBLEMS

1. The population of San Francisco is 750,000 in an area of 49 square miles. What is the population density in San Francisco? Express your answer in people per acre. (1 mi^2 = 640 acres) 24 people/acre

$$\frac{750{,}000\ p}{49\ mi^2} \times \frac{1\ mi^2}{640\ acres}$$

2. A sugar-free powdered drink mix sells for $2.99 per can. Each can of the mix contains 50.2 g of powder, which, when added to water, will make 8 quarts of drink. What is the cost of the powdered drink mix in dollars/lb? (454 g = 1 lb) $27.0/lb

$$\frac{1\ cm}{50.2\ g} \times \frac{454\ g}{1\ lb} \times \frac{2.99\ \$}{can}$$

3. A car is travelling at 60 miles per hour. Express this speed in kilometers per hour (km/h). (1 mi = 1.609 km) 96.54 km/h

$$60\ \frac{mi}{h} \times \frac{1.609\ km}{1\ mi}$$

4. A whole chicken sells for $7.06 and has a mass of 1.5 kg. A beef shank sells for $10.00 with a mass of 2.5 kg. Compare the per pound cost for each item. (1 kg = 2.2 lb) Beef is less

c $2.14/lb
b $1.82/lb

5. How many seconds are there in a day? (1 day = 24 h) 86,400 s

$$1\ day \times \frac{24\ h}{day} \times \frac{60\ min}{h} \times \frac{60\ sec}{1\ min}$$

6. The speed limit on a certain highway is 72 km/h. What is this speed in cm/s? 2.0 × 10^3 cm/s

$$72\ \frac{km}{h} \times \frac{1000\ m}{km} \times \frac{100\ cm}{m} \times \frac{1\ h}{60\ min} \times \frac{1\ min}{60\ s}$$

7. Gold has a density of 19.3 g/cm^3. What is the mass, in kilograms, of one cubic meter of gold? 1.93×10^4 kg

$$1\ m^3 \times 19.3\ \frac{g}{cm^3} \times \left(\frac{100\ cm}{1\ m}\right)^3 \times \frac{1\ kg}{1000\ g}$$

8. An automobile can travel 40.0 miles on one gallon of gasoline. How many kilometers per liter is this? (1.61 km = 1 mi; 1 L = 0.264 gal) 17.0 km/L

$$40\ \frac{mi}{gal} \times \frac{0.264\ gal}{1\ L} \times \frac{1.61\ km}{1\ mi}$$

9. Suppose that gold is selling at $375/ounce. How many milligrams of gold could you buy for one cent? (16 oz = 1 lb; 1 lb = 454 g) 75.7 mg

$$\$1.00 \times \frac{1\ oz}{\$375} \times \frac{1\ lb}{16\ oz} \times \frac{454\ g}{1\ lb} \times \frac{1000\ mg}{1\ g}$$

SECTION 3.4 DENSITY

Use the data in Table 3.7 to solve problems 1–4.

1. What is the mass at 20°C of 5 liters of air? 6.00 g
2. A balloon filled with air is released in a room filled with carbon dioxide. Will the balloon float to the ceiling or sink to the floor? Air less dense than CO_2
3. What is the volume in liters of a kilogram of ice at 0°C? 1.09 L
4. What is the mass of a bar of aluminum measuring 1.0 cm by 1.0 cm by 10.0 cm? 27 g