1.81 Round off or add zeros to the following calculated answers to give a final answer with three significant figures:
a. 0.00001258 L
b. $3.528 * 10^2$kg
c. 125111 m
d. 58.703 g

1.82 Round off or add zeros to the following calculated answers to give a final answer with two significant figures:
a. 0.004 mL
b. 34 677 g
c. 4.393 cm
d. $1.74 * 10^3$ ms

1.83 What is the total mass, in grams, of a dessert containing 137.25 g of vanilla ice cream, 84 g of fudge sauce, and 43.7 g of nuts?

1.84 A fish company delivers 22 kg of salmon, 5.5 kg of crab, and 3.48 kg of oysters to your seafood restaurant.
a. What is the total mass, in kilograms, of the seafood?
b. What is the total number of pounds?

1.85 During a workout at the gym, you set the treadmill at a pace of 55.0 m/min. How many minutes will you walk if you cover a distance of 7500 ft?

1.86 Bill's recipe for onion soup calls for 4.0 lb of thinly sliced onions. If an onion has an average mass of 115 g, how many onions does Bill need?

1.87 The following nutrition information is listed on a box of crackers:
- Serving size 0.50 oz (6 crackers)
- Fat 4 g per serving
- Sodium 140 mg per serving

a. If the box has a net weight (contents only) of 8.0 oz, about how many crackers are in the box?
b. If you ate 10 crackers, how many ounces of fat did you consume?
c. How many grams of sodium are used to prepare 50 boxes of crackers in part a?

1.88 The price of 1 lb of potatoes is $1.75. If all the potatoes sold today at the store bring in $1420, how many kilograms of potatoes did grocery shoppers buy?

1.89 In Mexico, avocados are 48 pesos per kilogram. What is the cost, in cents, of an avocado that weighs 0.45 lb if the exchange rate is 13.0 pesos to the dollar?

1.90 An aquarium store unit requires 75,000 mL of water. How many gallons (1 gal = 4 qt) of water are needed?

1.91 a. Some athletes have as little as 3.0% body fat. If such a person has a body mass of 65 kg, how many pounds of body fat does that person have?

b. In a process called *liposuction*, a doctor removes fat deposits from a person's body. If body fat has a density of 0.94 g/mL and 3.0 liters of fat are removed, how many pounds of fat were removed from the patient?

1.92 Celeste's diet restricts her intake of protein to 24 g per day. If she eats an 8.0-oz burger that is 15.0% protein, has she exceeded her protein limit for the day? How many ounces of a burger would be allowed for Celeste?

1.93 The water level in a graduated cylinder initially at 215 mL rises to 285 mL after a piece of lead is submerged. What is the mass, in grams, of the lead?

1.94 A graduated cylinder contains 155 mL of water. A 15.0-g piece of iron and a 20.0-g piece of lead are added. What is the new water level, in milliliters, in the cylinder?

1.95 Sterling silver is 92.5% silver by mass, with a density of 10.3 g/cm$^3$. If a cube of sterling silver has a volume of 7.0 cm$^3$, how many ounces of pure silver are present?

1.96 A typical adult body contains 55% water. If a person has a mass of 65 kg, how many pounds of water does she have in her body?

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Answers…

1.81 Round off or add zeros to the following calculated answers to give a final answer with three significant figures:
a. 0.00001258 L ..... 0.0000126 L
b. $3.528 * 10^2$ kg ..... $3.53 * 10^2$ kg
c. 125111 m ..... 125000 m
d. 58.703 g ..... 58.7 g

1.82 Round off or add zeros to the following calculated answers to give a final answer with two significant figures:
a. 0.004 mL ..... 0.0040 mL
b. 34677 g ..... 35000 g
c. 4.393 cm ..... 4.4 cm
d. $1.74 * 10^3$ ms ..... $1.7 * 10^3$ ms

1.83 What is the total mass, in grams, of a dessert containing 137.25 g of vanilla ice cream, 84 g of fudge sauce, and 43.7 g of nuts?

137.25 g
84 g
43.7 g
-------.-------
264.95 g

265 g

1.84 A fish company delivers 22 kg of salmon, 5.5 kg of crab, and 3.48 kg of oysters to your seafood restaurant.
a. What is the total mass, in kilograms, of the seafood?

22 kg
5.5 kg
3.48 kg
-------.-------
30.98 kg

31 kg

b. What is the total number of pounds? (Given that 2.20 pounds equals exactly 1 kg.)

$$31\ kg * \frac{2.20\ lbs}{1\ kg} = 68.2\ lbs$$

68 lbs

1.85 During a workout at the gym, you set the treadmill at a pace of 55.0 m/min. How many minutes will you walk if you cover a distance of 7500 ft? (Given that 2.54 cm exactly equals 1 inch.)

$$7500\ ft * \frac{12\ in}{1\ ft} * \frac{2.54\ cm}{1\ in} * \frac{1\ m}{100\ cm} * \frac{1\ min}{55.0\ m} = 41.5636363\ min$$

42 min

1.86 Bill's recipe for onion soup calls for 4.0 lb of thinly sliced onions. If an onion has an average mass of 115 g, how many onions does Bill need? (Given that 2.20 pounds equals exactly 1 kg.)

$$4.0\ lbs * \frac{1\ onion}{115\ g} * \frac{1\ kg}{2.20\ pounds} * \frac{1000\ g}{1\ kg} = 15.8102766798419\ onions$$

16 onions

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1.87 The following nutrition information is listed on a box of crackers:

- Serving size 0.50 oz (6 crackers) (note that 6 is an exact number)
- Fat 4 g per serving
- Sodium 140 mg per serving

a. If the box has a net weight (contents only) of 8.0 oz, about how many crackers are in the box? (Note that box is an exact number)

$$\frac{6\ crackers}{0.50\ oz} * \frac{8.0\ oz}{box} = 96\ {}^{crackers}/_{box}$$

96 crackers/box

b. If you ate 10 crackers, how many ounces of fat did you consume?

$$\frac{4\ g\ fat}{1\ serving} * \frac{1\ serving}{20\ crackers} * 10\ crackers = 2\ g\ fat$$

2 g fat

c. How many grams of sodium are used to prepare 50 boxes of crackers in part a?

$$\frac{140\ mg\ salt}{serving} * \frac{1\ gram}{1000\ mg} * \frac{1\ serving}{6\ crackers} * \frac{96\ crackers}{1\ box} * 50\ boxes = 112\ g\ salt$$

110 g salt

1.88 The price of 1 lb of potatoes is $1.75. If all the potatoes sold today at the store bring in $1420, how many kilograms of potatoes did grocery shoppers buy? (Given that 2.20 pounds equals exactly 1 kg.)

$$\frac{1\ lb}{\$1.75} * \$1420 * \frac{1\ kg}{2.20\ lbs} = 368.8311688311688\ kg$$

369 kg

1.89 In Mexico, avocados are 48 pesos per kilogram. What is the cost, in cents, of an avocado that weighs 0.45 lb if the exchange rate is 13.0 pesos to the dollar? (Given that 2.20 pounds equals exactly 1 kg.)

$$\frac{48\ pesos}{kg} * \frac{\$1.00}{13.0\ pesos} * \frac{100\ ¢}{\$1.00} * \frac{1\ kg}{2.20\ lbs} * 0.45\ lbs = 75.52447552447552¢$$

76¢

1.90 An aquarium store unit requires 75,000 mL of water. How many gallons (1 gal = 4 qt) of water are needed? (Given that 1 gallon equals 3.78541 liters)

$$75000\ ml * \frac{1\ l}{1000\ ml} * \frac{1\ gal}{3.78541\ l} = 19.81291326434917\ gal$$

20 gal

1.91 a. Some athletes have as little as 3.0% body fat. If such a person has a body mass of 65 kg, how many pounds of body fat does that person have? (Given that 2.20 pounds equals exactly 1 kg.)

$$65\ kg\ person * \frac{3.0\ kg\ Fat}{100\ kg\ Person} * \frac{2.20\ lbs}{1\ kg} = 4.29\ lbs$$

4.3 lbs

b. In a process called *liposuction*, a doctor removes fat deposits from a person's body. If body fat has a density of 0.94 g/mL and 3.0 liters of fat are removed, how many pounds of fat were removed from the patient? (Given that 2.20 pounds equals exactly 1 kg.)

$$3.0\ liters * \frac{0.94\ g}{ml} * \frac{1000\ ml}{l} * \frac{1\ kg}{1000\ g} * \frac{2.20\ lbs}{1\ kg} = 6.204\ lbs$$

6.2 lbs

1.92 Celeste's diet restricts her intake of protein to 24 g per day.

a. If she eats an 8.0-oz burger that is 15.0% protein, has she exceeded her protein limit for the day? (Given that 1 ounce equals 28.3495 grams)

$$8.0\ oz\ burger * \frac{28.3495\ g}{1\ oz} * \frac{15.0\ g\ protein}{100\ g\ burger} = 34.0194\ g\ protein$$

34 g protein

Yes

b. How many ounces of a burger would be allowed for Celeste?

$$24g * \frac{1\ oz}{28.3495\ g} * \frac{100\ g\ burger}{15.0\ g\ protein} = 5.64383851567047 oz\ burger$$

5.6 oz burger

Note: Performing part "b" first would allow you to answer question "a" without performing the work performed in part "a".

1.93 The water level in a graduated cylinder initially at 215 mL rises to 285 mL after a piece of lead is submerged. What is the mass, in grams, of the lead? (Given that the density of lead is 11.34 g/ml)

$$(285ml - 215ml) * \frac{11.34g}{ml} = 793.8\ g$$

790 g

Note: The correct number of significant digits is two. Check this by subtracting the two numbers.

1.94 A graduated cylinder contains 155 mL of water. A 15.0-g piece of iron and a 20.0-g piece of lead are added. What is the new water level, in milliliters, in the cylinder? (Given that Iron has a density of 7.874 g/ml and that the density of lead is 11.34 g/ml)

$$\left(15.0\ g\ Fe * \frac{ml}{7.874\ g}\right) + \left(20.0\ g\ Pb * \frac{ml}{11.34}\right) + 155\ ml = 158.6686722403427\ ml$$

159 ml

1.95 Sterling silver (Ag/Cu) is 92.5% silver by mass, with a density of 10.3 g/cm$^3$. If a cube of sterling silver has a volume of 7.0 cm$^3$, how many ounces of pure silver (Ag) are present? (Given that 1 ounce equals 28.3495 grams)

$$7.0\ cm^3\ Ag/Cu * \frac{10.3\ g\ Ag/Cu}{1\ cm^3\ Ag/Cu} * \frac{92.5\ g\ Ag}{100\ g\ Ag/Cu} * \frac{1\ oz}{28.3495\ g} = 2.3525\ oz\ Ag$$

2.4 oz Ag

1.96 A typical adult body contains 55% water. If a person has a mass of 65 kg, how many pounds of water does she have in her body? (Given that 2.20 pounds equals exactly 1 kg.)

$$65\ kg\ person * \frac{55\ g\ water}{100\ g\ person} * \frac{2.20\ lbs}{1\ kg} = 78.65\ lbs\ water$$

79 lbs