# Chapter 3: Practice Problem Answers
# MEASUREMENT SYSTEMS

1. What is the metric system's basic unit of measure for length?
   c. Meter

2. The prefix "deci" represents what value?
   d. .1

3. What is the metric system's basic unit of measure for weight?
   c. Gram

4. What prefix and symbol represent one hundred?
   b. Hecto, h

5. The prefix "micro" has what value?
   c. One millionth

6. What is the metric system's basic unit of measure for volume?
   a. Liter

7. Using the avoirdupois system, how many ounces are in a pound?
   c. 16

8. What is the basic avoirdupois unit of measure for weight?
   c. Grain

9. One tablespoon equals how many milliliters?
   a. 15

10. How many grains does an avoirdupois pound equal?
    c. 7,000

11. One quart equals how many cups?
    c. 4

12. How many millimeters are in 3 centimeters?
    b. 30

13. True or False: The ounce measure in the household and apothecary systems both measure weights?
    False

14. One inch equals how many centimeters?
    c. 2.54

**Convert the following units of measure.**

15. 56 g = _____ mg

    From grams to milligrams there are three spaces, so the decimal should move three spaces to the right.

    56 g = 5 6 . 0 0 0 = 56,000 mg
    $\rightarrow\rightarrow\rightarrow$

    d. 56,000

16. 4,670 mg = _____ g

    From milligrams to grams there are three spaces, so the decimal should move three spaces to the left.

    4,670 mg = 4 6 7 0 = 4.67 g
    $\leftarrow\leftarrow\leftarrow$

    b. 4.67

17. 1.2 mg = _____ mcg

From milligrams to micrograms there are three spaces, so the decimal should move three spaces to the right.

1.2 mg = 1 . 2 0 0 = 1,200 mcg
$\quad\quad\quad\;\;$ →→→

   c.  1,200

18. 0.3 L = _____ mL

From liters to milliliters there are three spaces, so the decimal should move three spaces to the right.

0.3 L = 0 . 3 0 0 = 300 mL
$\quad\quad\quad\;\;$ →→→

   c.  300

19. 5,800 cm = _____ m

From centimeters to meters there are two spaces, so the decimal should move two spaces to the left.

5,800 cm = 5 8 0 0 = 58 m
$\quad\quad\quad\quad\;\;$ ←←

   b.  58

20. 2,125 mL = _____ L

From milliliters to liter there are three spaces, so the decimal should move three spaces to the left.

2,125 mL = 2.125 L
$\quad$ ←←←

   b. 2.125

21. 7.4 m = _____ cm

From meters to centimeters there are two spaces, so the decimal should move two spaces to the right.

7.4 m = 7.40 = 740 cm

      →→

  b.  740

22. 45 inches = _____ cm

Every inch equals 2.54 centimeters.

45 inches x 2.54 cm/inch = 114.3 cm

    d.  114.3

23. 45 mL = _____ tbs (Note: Book says lb in error.)

Every tablespoon equals 15 mL.

45 mL / 15 mL/tbs = 45 ~~mL~~ x $\underline{1\ tbs}$ = $\underline{45}$ = 3 tbs
                           15 ~~mL~~   15

    b.  3

24. 7.2 m = _____ inches

Every inch equals 2.54 cm, and every meter equals 100 centimeters. From meters to centimeters there are two spaces, so the decimal should move two spaces to the right.

7.2 m = 7.20 = 720 cm

720 cm / $\underline{2.54\ cm}$ = 720 ~~cm~~ x $\underline{1\ inch}$ = $\underline{720}$ = 283.46 inches
           inch              2.54 ~~cm~~  2.54

    d.  283.46

25. 142 gr = _____ mg

Every grain contains 65 mg.

142 gr / 65 mg/gr = 9,230 mg

c.  9,230

26. 62 kg = _____ lb

Every kilogram equals 2.2 pounds.

62 kg  x  2.2 lb = 136.41 lb
         kg

   a.  136.4

27. 7 pt = _____ mL

Every pint equals 473 millileters.

7 pt x 473 mL/pt = 3,311 milliliters

   b.  3,311

28. 4 oz = _____ tsp

Every ounce equals 30 milliliters and every teaspoon equals 5 milliliters. First convert ounces to milliliters.

4 oz x 30 mL  =  120 mL
         oz

Then convert millimeters to teaspoons.

120 mL x tsp = 120  = 24 tsp
         5 mL    5

   d.  24

29. 2 gal = _____ pt

Every gallon equals 4 quarts and every quarter equals 2 pints. First convert gallons to quarts.

2 gal x 4 qt/gal = 8 qt

Then convert quarts to pints.

8 qt x 2 pt/qt = 8 x 2 = 16 pt

   c.  16

30. 6 oz = _____ gr

Every ounce equals 437.5 grains.

6 oz x $\underline{437.5 \text{ gr}}$ = 2,625 gr
           oz

   b. 2,625

31. 18 qt = _____ pt

Every quart equals two pints.

18 qt  x  $\underline{2 \text{ pt}}$ = 36 pt
         qt

   d.  36

32. 7,000 gr = _____ oz

Every ounce equals 437.5 grains.

7,000 gr  /  $\underline{437.5 \text{ gr}}$ = 7,000 x $\underline{1 \text{ oz}}$
           1 oz         437.5

$\underline{7,000}$ = 16 oz
437.6

   c. 16

33. 14 tsp = _____ mL

Every teaspoon equals 5 milliliters.

14 tsp x $\underline{5 \text{ mL}}$ = 14 x 5  = 70 tsp
       tsp

d.  70

34. 255 lb = _____ kg

Every kilogram equals 2.2 pounds.

255 lb  /  2.2 lbs = 255 lb x 1 kg
     1 kg      2.2 lb

255 = 115.9 kg
2.2

   c.  115.9

35. 734 mg = _____ gr

Every grain equals 65 milligrams.

734 mg / 65 mg/gr = 734 ~~mg~~  x  1 gr
           65  ~~mg~~

734  =  11.29 gr
 65

   a.  11.29

36. 3 cups = _____ mL

Every cup equals 240 milliliters.

3 ~~cups~~  x  240 mL = 720 mL
      ~~cups~~

   b.  720

37. 13 g = _____ gr

Every gram equals 15 grains.

13 ~~g~~  x  15 gr  =  13 x 15 = 195 gr
     ~~g~~

b. 195 (please note: book lists b. 200 in error)

38. 300 gr = _____ oz

Every ounce equals 437.5 gr.

300 gr / $\underline{437.5}$ gr = 300 g̶r̶ x $\underline{1\ oz}$
   oz                      437.5 g̶r̶

$\underline{300}$ = 0.6857 rounded to 0.69 gr
437.5

   d.  0.69

39. 85 kg = _____ lb

Every kilogram equals 2.2 pounds.

85 kg x $\underline{2.2\ lb}$ = 85 x 2.2 = 187 lb
        kg

   b.  187

40. 14 cups = _____ mL

Every cup equals 240 milliliters.

14c x 240 mL/c = 14 x 240 = 3,360 mL

   c.  3,360