6.2 Exercises

Concept Check

Fill-in-the-Blank. Complete each sentence using information found in this section.

1. In the metric system, commas are not used. Digits are instead grouped in _____ with spaces between the groups.
2. If there is no whole number of units in the metric system, a/an _____ is written to the left of the decimal point.
3. The basic unit of length in the metric system is the _____.
4. In the metric system, conversions from smaller to larger units require _____ by a power of 10.
5. To change from larger to smaller metric units, _____ by a power of 10.

True/False. Determine whether each statement is true or false. If a statement is false, explain how it can be changed so the statement will be true. (**Note:** There may be more than one acceptable change.)

6. To change from smaller units to larger units, multiplication must be used.
7. Units of length in the metric system are named by putting a prefix in front of the basic unit meter, for example, centimeter.
8. In metric units, a square that is 1 centimeter long on each side is said to have an area of 1 centimeter.

Practice

Use this ruler to help measure (or approximate) each length. (Answers will vary.) The ruler shown here is marked with millimeters and centimeters.

1. The width of a pencil
2. The diameter (distance across) of a penny
3. The width of your thumb
4. The width of your little finger
5. The thickness of a watch band
6. The height of a cell phone
7. The width of a paper clip
8. The thickness of a dime
9. The length and width of a dollar bill
10. The length and width of your school ID

What metric unit of length would you use to measure each item? (Choose from millimeters, meters, and kilometers.)

11. A sprint distance on a track

12. The length of a room

13. The height of a building

14. The distance between Houston, TX, and San Antonio, TX

15. The width of the head of a straight pin

16. The thickness of a stick of gum

Convert each measurement. See Examples 1, 3, and 4.

17. 3 m = ___ cm

18. 60 m = ___ dm

19. 0.8 m = ___ cm

20. 1.9 cm = ___ mm

21. 1.5 m = ___mm

22. 13.6 km = ___ m

23. 36 mm = ___ cm

24. 140 cm = ___ dm

25. 82 cm = ___ m

26. 4.8 mm = ___ cm

27. 5.25 cm = ___m

28. 19.77 m = ___km

29. 750 mm = ___ m

30. 185 m = ___ km

31. Change 245 mm to meters.

32. Change 87 mm to meters.

33. Convert 23 cm to meters.

34. Convert 3.2 mm to centimeters.

35. How many kilometers are in 10 000 m?

36. How many meters are in 1100 cm?

37. What number of meters is equivalent to 20 000 cm?

38. What number of kilometers is equivalent to 140 000 m?

39. Express 679 cm in kilometers.

40. Express 3872 mm in kilometers.

Convert each measurement. See Example 5.

41. 150 300 000 000 bytes = ___ GB

42. 6 500 000 hertz = ___ megahertz

43. 30 MB = ___ bytes

44. 24 GB = ___ bytes

Convert each measurement. See Examples 6 through 9.

45. 9.6 cm^2 = _____ mm^2

46. 4.52 cm^2 = _____ mm^2

47. 500 mm^2 = _____ cm^2

48. 39 mm^2 = _____ cm^2

49. 0.5 m^2 = _____ mm^2

50. 3 m^2 = _____ mm^2

51. 13 dm^2 = _____ cm^2 = _____ mm^2

52. 6.4 dm^2 = _____ cm^2 = _____ mm^2

53. 11.5 m^2 = _____ cm^2 = _____ mm^2

54. 3.6 m^2 = _____ cm^2 = _____ mm^2

55. 0.04 m^2 = _____ cm^2 = _____ mm^2

56. 0.6 m^2 = _____ cm^2 = _____ mm^2

57. 6.7 a = _____ m^2

58. 0.45 a = _____ m^2

59. 200 a = _____ m^2

60. 0.8 a = _____ m^2

61. Change 5.75 km^2 to hectares.

62. Change 0.4 km^2 to hectares.

63. 9.56 ha = _____ a = _____ m^2

64. 0.27 ha = _____ a = _____ m^2

65. 6.25 m^2 = _____ a = _____ ha

66. 35 m^2 = _____ a = _____ ha

Applications

Solve.

67. A triangle has a base measuring 4 cm and a height measuring 16 mm. Determine the area of the triangle in cm^2.

68. For the 10-km-long Bridge Run, officials set up water tables every 635 meters, starting at the start line. How many water tables are set up for the Bridge Run?

69. The current world record for the men's long jump is 8.95 m, set by Mike Powell in 1991. Bob Beamon held the previous record of 8.90 m for 23 years. By how many mm did Mike Powell beat Bob Beamon's record?

70. DeQuan has four pieces of metal that must be welded end-to-end in order to form a spill tray. If the pieces measure 35 cm, 112 mm, 4 decimeters, and 1.2 meters, how long will the tray be (in meters)?

71. A rectangular backyard measures 4 hectometers by 11 dekameters. How many square meters is the backyard?

72. A section of railroad track measuring 2.1 km in length needs to be replaced. Each railroad tie is 4 decimeters wide and they are to be spaced 0.8 m apart. How many railroad ties will be needed to complete this section of track?

73. A certain type of computer processor has a speed of 6 000 000 000 hertz. What is the speed of this computer processor in gigahertz?

74. A demolition crew used 5 megatons of dynamite to clear away a rock formation. How many metric tons of dynamite did they use?

75. Two hard drives contain 3.75 terabytes and 4.25 terabytes of information, respectively. What is the difference in the amount of information stored on the two hard drives in gigabytes? (**Hint:** Convert terabytes to bytes, then to gigabytes.)

76. A camera with 14 megapixels has how many more pixels than a camera with 12 megapixels?

77. A farm has an area of 7500 ares. What is the area of the farm in hectares?

78. Arches National Park has an area of 310,300,000 m^2. What is the area of Arches National Park in square kilometers?

79. Two lakes have areas of 1.25 km^2 and 1.18 km^2, respectively. What is the difference in area of the two lakes in square meters?

80. A US nickel has an area of approximately 353.32 mm^2. What is the area of a nickel in square centimeters?

Writing & Thinking

81. Compare and contrast ease of converting units in the US customary system and the metric system.

82. Discuss how to convert units within the metric system.

83. Discuss the meaning of prefixes like milli-, centi-, and kilo- in metric units. Give examples.

84. Discuss the meaning of the prefixes kilo-, mega-, giga-, and tera- in technology.