b. To convert to Celsius, Whitley must use the formula $C = \frac{5(F-32)}{9}$.

$$C = \frac{5(425-32)}{9} \quad \text{Make the appropriate substitution.}$$

$$C = \frac{1965}{9} \quad \text{Simplify.}$$

$$C = 218.3\overline{3}$$

Therefore, Whitley needs to set the oven to approximately 218 °C.

✔ Skill Check 7.5.4

Convert 68 °F to °C.

Skill Check Answers

1. 4.70 yards **2.** 59.06 inches **3.** 0.02 lb/in. **4.** 20 °C

7.5 Exercises

✔ CONCEPT CHECK

1. Temperature, time, and length are examples of different physical _____.

2. The relationship between different physical quantities of the same dimension can be compared using _____ _____.

3. Conversion factors are typically _____.

4. The two most common units for measuring temperature are degrees _____ and degrees _____.

5. One inch is equal to exactly _____ centimeters.

PRACTICE

Convert each measurement using the appropriate conversion factor. Round your answer to the nearest thousandth, if necessary. Note that answers may vary depending on the conversion factor used.

6. Convert 52 centimeters to inches.

7. Convert 150 miles to kilometers.

8. What number of yards is equivalent to 800 m?

9. What number of meters is equivalent to 150 ft?

10. Convert 200 ft^2 to square centimeters.

11. Convert 12 ha to acres.

12. What number of square yards is equivalent to 40 m^2?

13. What number of square kilometers is equivalent to 20 mi^2?

14. 40 lb = _____ kg

15. 35 g = _____ oz

16. Convert 22 kg to pounds.

17. Convert 42 oz to grams.

18. 16 c = _____ L

19. 6 L = _____ gal

20. Convert 800 $in.^3$ to cubic meters.

21. Convert 100 mL to tablespoons.

22. Convert 198.1 ft to centimeters.

23. What number of inches is equivalent to 760.82 km?

24. 21 ft/sec to m/min

25. 50 km/hr to mi/min

26. 1.35 g/mL to lb/gal

27. 3 oz/cup to g/L

28. 5.22 g/cm to lb/in.

29. 4.6 g/cm to lb/ft

30. 240 ft^2/gal to m^2/L

31. 25 m^2/kg to yd^2/lb

32. 45 °C = _____ °F

33. 177 °C = _____ °F

34. –40 °F = _____ °C

35. 275 °F = _____ °C

36. What is 16 °C in degrees Fahrenheit?

37. What is 25 °C in degrees Fahrenheit?

38. Convert 100 °F into degrees Celsius.

39. Convert 12 °F into degrees Celsius.

40. Rank the following mass measurements from smallest to largest:

2 oz 18 kg 50g 2 lb 35 mg

41. Rank the following length measurements from smallest to largest:

100 yd 100 m 10 km 10 mi 10 ft 100 cm 100 in.

APPLICATIONS

42. The density of mercury is 13.56 g/mL. What is its density in lb/ft^3?

43. The density of gold is 19.32 g/cm^3. What is its density in lb/ft^3?

44. A toilet flushes with a pressure of 1.6 gal/ft. What is the pressure in SI units (m/L)?

45. A domestic pressure washer sprays water at a rate of 3 GPM (gal/min). What is the spray rate in L/sec?

46. A gas station is charging $2.299 per gallon of gas. What would be the price for a liter of gas?

47. The sign on a freeway in Canada indicates that the speed limit is 100 km/hr. What would the speed limit be in miles per hour?

48. Allison buys embroidery thread for sewing. There are 8.7 yards of thread in each skein. She uses 1 meter. How much thread is left in the skein in meters? Round your answer to the nearest thousandth, if necessary.

49. Suppose it takes John 7 minutes to run 1 mile. How long would it take him to run 3 kilometers? Round your answer to the nearest minute.

50. A website for a new European Low Carb diet provides recipes using metric units of measurement. Convert each ingredient to the indicated measurement. Round to the nearest tenth, if necessary.

a. 5 mL of vanilla = _____ tsp

b. 30 g of ground flax = _____ oz

c. 25 g of almond flour = _____ oz

51. A French recipe for Pain au Chocolat calls for 120 mL of milk and needs the oven preheated to 190 °C. You only have measuring cups in fluid ounces and Fahrenheit on your oven temperature dial. Determine the amount of milk needed in fluid ounces and the temperature for the oven in Fahrenheit. Round your answer to the nearest tenth, if necessary. (**Note:** There are 8 fluid ounces per cup.)

52. The medicine bottle says to take 5 teaspoons every four hours, but your medicine cup only has milliliters. How many milliliters do you need to take?

53. Sandra is on vacation. The hotel clerk at the ski resort tells her that the high temperature for tomorrow is going to be –7 °C. How many degrees Fahrenheit is it going to be?

54. Matt is looking to purchase a new car. The sticker says that the car has an average fuel economy of 18 km/L. How many miles per gallon is that?

55. Logan has made 97 pints of maple syrup. A buyer has offered him $37.28 per gallon. How many gallons does he have made, and how much money will he make if he the buyer purchases all of the maple syrup?

56. The directions for a drink mix say to add 8 teaspoons of sugar for every gallon of liquid. If Sam has 7.6 liters of liquid, how many teaspoons of sugar should he add?

57. Jeff built a model sailboat that can move at a maximum speed of 8 ft/sec. How fast can his sailboat in miles per hour?

58. John's model sailboat can move at a maximum speed of 90 m/min. Whose model sailboat is faster Jeff's or John's, and how much faster is it?

WRITING & THINKING

59. Carlos was trying to make his grandmother's Christmas cinnamon stars called zimtsternes.

The ingredient conversions calculated by Carlos are shown here.

350 g unblanched almonds → 12 oz unblanched almonds

400 g icing sugar → 13 oz icing sugar

22.5 mL ground cinnamon → 3 tbsp ground cinnamon

The recipe says to bake them at 140 °C for 20 to 30 minutes. Unfortunately, Carlos did not notice the temperature was given in Celsius and baked them at 140 °F. Would you eat these cookies? Explain your answer and include the conversions you based your decision on.

60. When using dimensional analysis with several conversion factors, would it be best to round during intermediate steps or wait until the end of the calculation to round? Explain your reasoning.