SOL 7.4—Ratios, Rates, Proportions, & Scale Drawings

Choose the best answer. Write proportions and show all work. Place letter answer in blank.

<u>Work Space</u>

_____ 1. It takes 90 minutes to wash 20 vehicles at a car wash. At this
rate, how many minutes does it take to wash 5 vehicles?

    A. 22 min.   B. 14 min

    C. $22\frac{1}{2}$ min.   D. $7\frac{1}{2}$ min.

_____ 2. Gabby can assemble 7 music books in 4 minutes. At this rate,
how many music books can she assemble in 2 hours?

            A. 14 books   B. 105 books

            C. 69 books   D. 210 books

_____ 3. The ratio of women to men in a local book club is 7 to 3.
Which combination of women to men could the club have?

    A. 14 women and 9 men   B. 31 women and 50 men

    C. 21 women and 15 men   D. 21 women and 9 men

_____ 4. Emmanuel can run 100 meters in 20 seconds. If he competes
in the 400-meter race, about how many seconds will it take
him to run the race?

    A. 5 sec.   B. 4 sec.

    C. 80 sec.   D. 20 sec.

_____ 5. Lindsey is planning to build a model of a train using a scale where
2 inches represents 25 feet. If the train is 60 feet long, what is the
length, in inches, that Lindsey should build the model of the train?
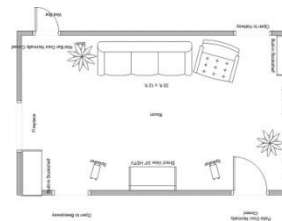
            A. 9.6 in.   B. 2.4 in.

            C. 4.8 in.   D. 1.2 in.

_____ 6. Ms. Adams walks between $\frac{4}{10}$ and $\frac{6}{10}$ mile every day. Which is the
best estimate of the number of miles she will walk in 30 days?

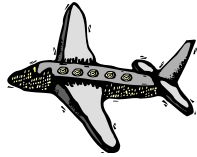   A. 12 miles   B. 15 miles   C. 18 miles   D. 20 miles

_____ 7. An interior designer made a scale model of a room.
Each 1 inch in the model represented 12 feet in the actual
room. If the length of a hall was $2\frac{1}{4}$ inches in the model,
what was the actual length of the hall?

    A. $8\frac{1}{4}$ ft.   B. $13\frac{1}{2}$ ft.   C. $16\frac{1}{2}$ ft.   D. 27 ft.

_____ 8. A scale distance of 3.5 centimeters on a certain map represents
an actual distance of 175 kilometers. What actual distance does
5.7 centimeters on the same map represent?

    A. 0.285 km.   B. 2.85 km.   C. 28.5 km.   D. 285 km.

_____ 9. Jimmy built a scale model of an airplane. The scale used
was $\frac{1}{4}$ inch equals a foot. The actual length of the
midsection of the plane was 92 feet. What was the
length of the midsection of the model?
A. 747 in.   B. 368 in.   C. 92 in.   D. 23 in.

_____ 10. Two ratios form a proportion if
    A. they have the same first term   B. they are equal
    C. they have the same second term   D. they compare two quantities

_____ 11. To solve $\frac{5}{6} = \frac{x}{16}$ by the cross-product method:
    A. find cross-products, then divide by 5
    B. find cross-products, then multiply by 6
    C. find cross-products, then divide by 6
    D. find cross-products, then multiply by 5

Write proportions to solve the following problems. Include units in your answer. Show all work in the space to the right.

12. A recipe calls for 3 teaspoons of sugar for every cup of milk. Austin used 4 cups of milk. How many teaspoons of sugar should he use?

_____

13. If it takes 5 hours to drive 250 miles, how many hours would it take to drive 600 miles?

_____

14. Alexis saw an advertisement for a 6-oz. tube of toothpaste that costs $0.90. How much should a 4-oz. tube cost?

_____

15. If you can buy 3 magazines for $15, how many magazines can you buy for $40?

_____

16. Two cities are 42 cm. apart on a map with a scale of 6 cm. = 60 km. What is the actual distance between the two cities?

_____

17. A map of the Eastern United States has a scale of 1 inch for 50 miles. The cities of New Haven, CT and Washington, DC are 4.8 inches apart on the map. What is the actual distance between the two cities?

_____

18. Express the ratio 650 miles in 13 hours as a unit rate.

_____

19. Jennifer drove her car 243 miles on 9 gallons of gas. How many miles per gallon did she get?

_____

20. Debbie walks her dog 1.5 miles in 22 minutes. How far will they walk in 44 minutes at the same pace?

_____

21. Solve these proportions: $\dfrac{5}{12} = \dfrac{x}{72}$ $\qquad$ $\dfrac{27}{y} = \dfrac{6}{8}$ $\qquad$ $\dfrac{1.5}{8} = \dfrac{n}{32}$

$x =$ _____ $\qquad$ $y =$ _____ $\qquad$ $n =$ _____

22. A scale drawing of a boat is 12 centimeters long. In the drawing, 3 centimeters represents 8 meters. What is the length of the boat?

_____

Convert the following measurements using proportions. Write proportions and use the table below for each scale factor. Round all answers to the nearest tenth and state the unit in your answers. Show all work.

1 centimeter	0.39 inch
1 cup	250 milliliters
1 kilogram	2.2 pounds
1 kilometer	0.621 mile
1 mile	1.609 kilometers
1 teaspoon	5 milliliters
1 yard	0.9144 meter

23. Melissa runs six kilometers each day. About how many miles does Melissa run each day?

_____

24. If a football field is 100 yards long. About how many meters is this distance?

_____

25. If the scale drawing of a house measures 40 centimeters wide, about how many inches wide is the drawing of the house?

_____

26. Myrtle Beach, SC is 450 miles from Wise. About how many kilometers is that distance?

    _____

27. If Tommy weighs 40 kilograms, about how many pounds does he weigh?

    _____

28. Janet is making cookies, and the recipe calls for 2.5 teaspoons of vanilla. About how many milliliters of vanilla is this?

    _____

29. A recipe calls for 750 milliliters of flour. How many cups of flour is this?

    _____

Convert the following using a proportion. Show all work.

30. Kerrie is traveling to Europe with the French Club. She needs to exchange $750 in US currency to Euros, which is the form of currency in many European countries. If the exchange rate is 0.83 Euros for each dollar, how many Euros will Kerrie have to take on her trip?

    _____

Bonus: Calculate the following unit rates to determine which is the better buy for cans of corn that are all the same size and brand. Circle the letter for the best buy.

    A. 3 cans for $2.00   _____   B. 6 cans for $5.00   _____

    C. 5 cans for $4.00   _____   D. 4 cans for $3.00   _____

Math SOL 7.4--Ratios, Rates, Proportions, & Scale Drawings
Answer Key

1. C
2. D
3. D
4. C
5. C
6. B
7. D
8. D
9. D
10. B
11. C
12. 12 teaspoons
13. 12 hours
14. $0.60
15. 8 magazines
16. 420 km
17. 240 km
18. 50 miles in 1 hour
19. 27 miles per hour
20. 3 miles
21. x = 30; y = 36; n = 6
22. 32 meters

For 23 – 29 proportions may vary.
23. 3.7 miles
24. 91.4 meters
25. 15.6 inches
26. 724.1 km
27. 88 pounds
28. 12.5 ml
29. 3 cups
30. $ 622.50 Euros
Bonus: A) $0.67 ; B) $ 0.83; C) $ 0.80 ; D) $ 0.75 ;   A is the best buy.