Applications Connections Extensions

ACE

Applications

For Exercises 1–6, tell whether the number is closest to 0, $\frac{1}{2}$, or 1. Explain your reasoning.

1. 0.07 **2.** 1.150 **3.** 0.391

4. 0.0999 **5.** 0.99 **6.** 0.599

7. Billie goes to the fabric store to buy material and other items she needs for a project. She has \$16.95 to spend. The material costs \$8.69. A container of craft glue costs \$1.95. A package of craft paper is \$4.29.

a. Estimate how much it will cost to buy the material, glue, and craft paper.

b. Did you overestimate or underestimate? Explain.

c. Billie also finds a package of ribbon that costs \$2.89. Based on your estimate in part (a), how much more money does she need if she buys the ribbon? Explain.

Add or subtract.

8. 3.42 + 5.8 **9.** 5.012 + 0.93 **10.** 10.437 + 4.0034

11. 0.403 + 0.07 **12.** 5.2 − 0.12 **13.** 4.54 − 2.9

14. 0.095 − 0.0071 **15.** 2.057 − 1.99 **16.** 10.91 − 1.068

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17. Ms. Palkowski cleans 0.125 of a mile of highway for a group of teachers and then 0.4 of a mile for the science club. How much does she clean altogether?

18. Multiple Choice Which is correct?

A.
$$\begin{array}{r} 81.9 \\ +\ 0.62 \\ \hline 88.1 \end{array}$$

B.
$$\begin{array}{r} 81.9 \\ +\ 0.62 \\ \hline 82.52 \end{array}$$

C.
$$\begin{array}{r} 81.9 \\ +\ 0.62 \\ \hline 8.81 \end{array}$$

D.
$$\begin{array}{r} 81.9 \\ +\ 0.62 \\ \hline 0.881 \end{array}$$

19. Estimate using fraction benchmarks.

a. 2.43 + 1.892 **b.** 4.694 − 1.23 **c.** 12.92 + 3.506 − 6.18

20. Gregory walks 1.8 miles from his home to school. Halfway between his home and school there is a music store. This morning, he wants to stop at the store before school. Right now he is 0.36 miles away from home.

a. How much more does he need to walk, in miles, to get to the store?

b. How many miles does he have left to walk to school?

21. Christopher, Tim, Lee, and Dwayne are running in a 4 × 100-meter relay race. Christopher runs his stretch in 12.35 seconds, Tim takes 13.12 seconds, and Lee takes 11.91. If the team wants to break the school record of 48.92 seconds, how fast will Dwayne have to run?

22. Karen, Lou, and Jeff each bought a miniature tree. They measured the height of their trees once a month over the five months from December to April.

Miniature Tree Height (m)

	December	January	February	March	April
Karen's Tree	0.794	0.932	1.043	1.356	1.602
Lou's Tree	0.510	0.678	0.84	1.34	1.551
Jeff's Tree	0.788	0.903	1.22	1.452	1.61

a. Who had the tallest tree at the beginning?

b. Whose tree was the tallest at the end of April?

c. Whose tree grew fastest during the first month?

d. Whose tree grew by the most from December to April?

Add or subtract.

23. $\frac{4}{5} + \frac{3}{4}$ **24.** $2\frac{3}{5} + \frac{3}{8}$ **25.** $1\frac{2}{3} + 3\frac{5}{6}$

26. $\frac{8}{3} - \frac{4}{5}$ **27.** $1\frac{4}{5} - \frac{1}{2}$ **28.** $4\frac{2}{8} - 1\frac{3}{4}$

29. Rewrite Exercises 23–28 with decimal numbers and find the results of the operations using the decimal equivalents of the numbers. Compare your decimal answers to the fraction answers.

30. Solve. Then write the complete addition-subtraction fact family.

a. 22.3 + 31.65 = N **b.** 18.7 − 4.24 = N

31. Add.

a. $4.9 + 3\frac{3}{4}$ **b.** 91.678 + 2.34 + 12.001 **c.** $2.75 + 3\frac{2}{5}$

32. Find the value of N that makes the mathematical sentence correct. Use fact families to help you.

a. 2.3 + N = 3.42 **b.** N − 11.6 = 3.75

33. Find the missing numbers.

a.
$$\begin{array}{r} 36.03 \\ +\ \square\square\square\square \\ \hline 45.218 \end{array}$$

b.
$$\begin{array}{r} \square\square\square\square \\ +\ 0.488 \\ \hline 13.762 \end{array}$$

c. 0.45 + N + 0.4 = 2.62 **d.** 75.4 − 10.801 + N = 77.781

34. Place decimal points in 102 and 19 so that the sum of the two numbers is 1.21.

35. Place decimal points in 34, 4, and 417 so that the sum of the three numbers is 7.97.

36. Place decimal points in 431 and 205 so that the difference between the two numbers is 16.19.

Connections

37. Which of the numbers is the greatest? How do you know?

81.9 81.90 81.900

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38. **Multiple Choice** Which group of decimals is ordered from least to greatest?

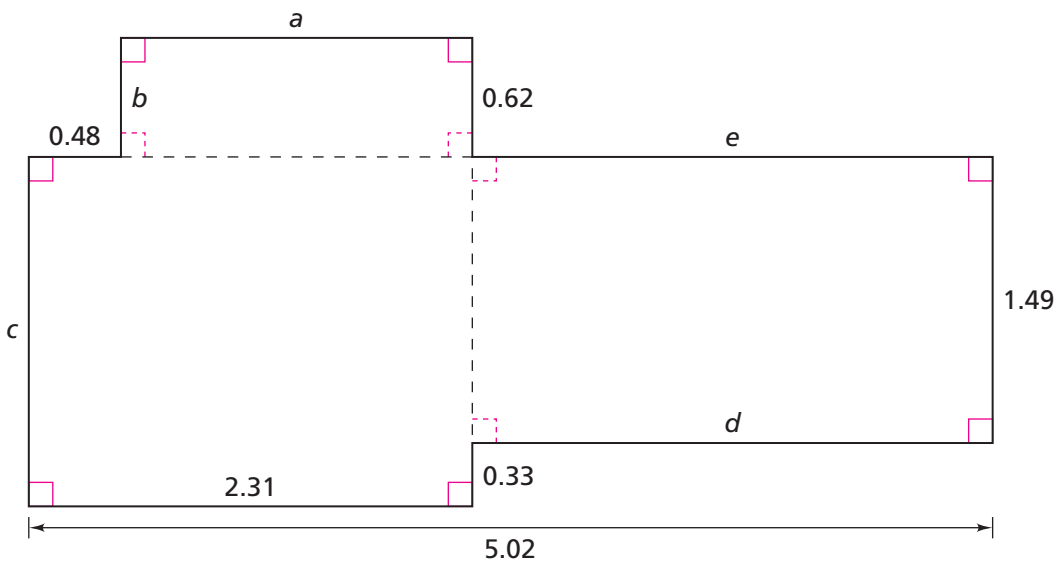
A. 5.6, 5.9, 5.09, 5.96, 5.139

B. 0.112, 1.012, 1.3, 1.0099, 10.12

C. 2.8, 2.109, 2.72, 2.1, 2.719

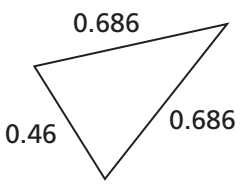
D. 0.132, 0.23, 0.383, 0.3905, 0.392

39. Find the missing lengths. Then find the perimeter of the figure. (All units are in inches.)



For Exercises 40–43, name the geometric figures and find their perimeters. (All units are in inches. The figures are not drawn to scale.)

40.



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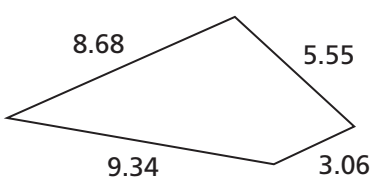

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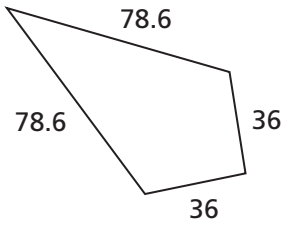

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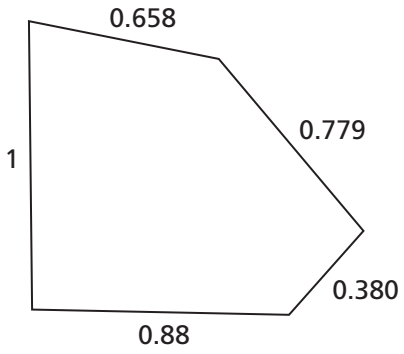
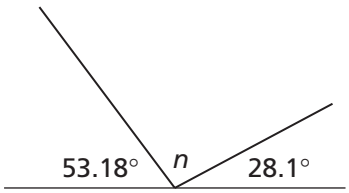


44. The perimeter of a parallelogram is 15.42 cm. The length of one of its sides is 2.93 cm. What are the lengths of its other sides?

Find the measures of the missing angles.

45.



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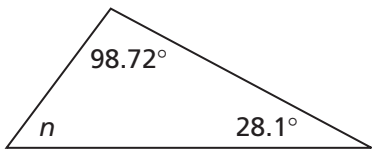


Extensions

47. a. In order to add 3 dollars and 35 cents to 5 dollars and 78 cents, you can write each amount as a decimal. Since 3.35 + 5.78 = 9.13, the total is 9 dollars and 13 cents.

Now consider adding time values in a similar way. For example, can you add 2 hours and 45 minutes to 3 hours and 57 minutes by using decimal numbers (2.45 + 3.57)? Explain.

b. Consider length measurements. You can add 13 meters and 47 centimeters to 4 meters and 72 centimeters using decimal numbers. Since 13.47 + 4.72 = 18.19, the total length is 18 meters and 19 centimeters.

Suppose you want to add 3 feet and 7 inches to 5 feet 6 inches. Can you apply the same idea so that you add 3.7 to 5.6 to get the total length? Explain.

48. Mark says that 3.002 must be smaller than 3.0019 since 2 is smaller than 19. How can you convince him that he is wrong?

For Exercises 49–52, use 1, 2, 3, or 4 to form decimal numbers so that each sum or difference is as close as possible to the given number. You may use the same digit twice in one number. For example, you may write 0.33. The symbol ≈ means "is approximately equal to."

49. $0.\square\square + 0.\square\square \approx \frac{1}{3}$

50. $0.\square\square - 0.\square\square \approx 0.125$

51. $0.\square\square - 0.\square\square \approx \frac{2}{7}$

52. $0.\square\square + 0.\square\square \approx 0.9$

For Exercises 53 and 54, use 1, 2, 3, or 4 to form decimal numbers so that each calculation is correct. You may use the same digit twice in one number.

53. $0.\square\square + 0.\square\square = 0.75$

54. $0.\square\square - 0.\square\square = 0.3$

55. Use the numbers 2, 9, 7, and 4 only once in each part to complete each decimal.

a. Write the greatest possible number of the form $3.\square\square\square\square$.

b. Write the least possible number of the form $3.\square\square\square\square$.

c. Write all the possible numbers of the form $3.\square\square\square\square$ that are greater than 3.795.

d. Write all the possible numbers of the form $3.\square\square\square\square$ that are less than 3.73 but greater than 3.4399.

56. Use the fact that there are 16 ounces in a pound to answer parts (a)–(d).

a. How many pounds are in 256 ounces?

b. How many ounces are in 0.125 pound?

c. How many ounces are in 3.375 pounds?

d. How many pounds are in 17 ounces? Express this as a mixed number and as a decimal.

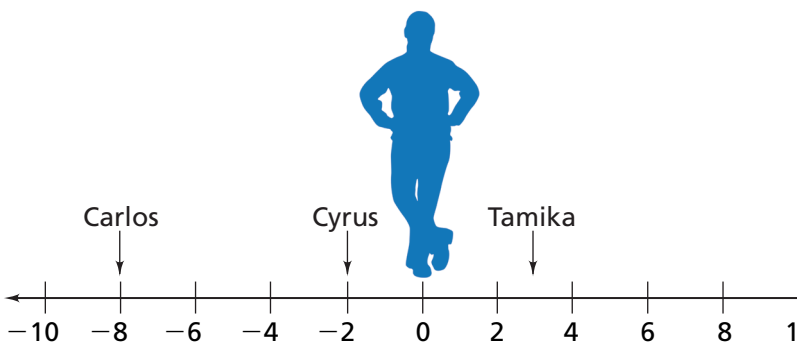
57. Julie has a bread recipe that calls for 1.75 pounds of flour.

a. She wants to make this recipe three times. How much flour does she need?

b. She has no flour at home. How many 5-pound bags of flour should she buy to make the recipe three times?

c. A ton is 2,000 pounds. Estimate how many loaves of bread she could make with a ton of flour.

58. Will likes to keep track of his friends on road clean-up day. He thinks of himself as being at 0 on the number line below. Friends who are on the road ahead of him he pictures to the right on a number line. Friends who are on the road behind him he pictures to the left.



Sample Tamika is 3 km ahead, at +3. Cyrus is 2 km behind, at −2. We read "+3" as "positive three" and "−2" as "negative 2."

a. Justin is 3 km behind Will. Mark his position on a copy of the number line above.

b. Carlos is at the location shown on the number line. Is Carlos ahead of or behind Will? By how many kilometers?

c. Write three more numbers that show locations behind Will.

d. Write three numbers that show locations ahead of Will.