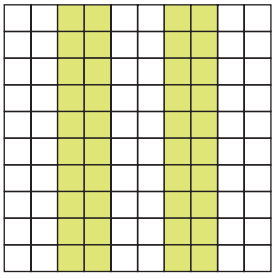
Applications

For Exercises 1–5, the whole is one hundredths grid. Write fraction and decimal names for the shaded part.

1.



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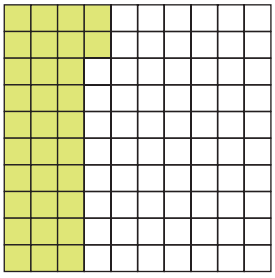

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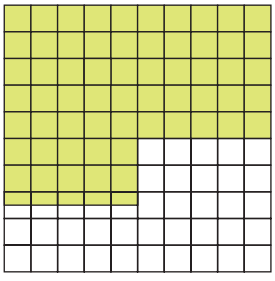

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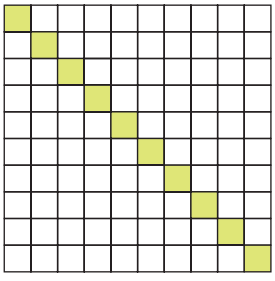

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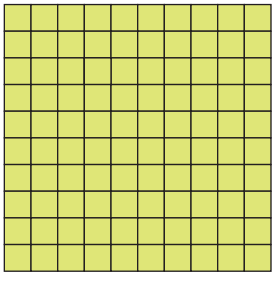

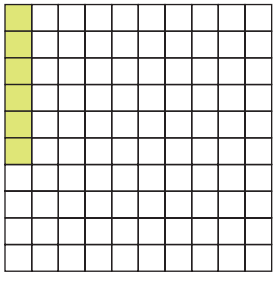

6. Name three fractions whose decimal equivalent is 0.25. Explain how you know each fraction is equivalent to 0.25. Draw a picture if it helps you explain your thinking.

7. Name three fractions whose decimal equivalent is 0.40. Explain how you know each fraction is equivalent to 0.40. Draw a picture if it helps you explain.

8. In parts (a)–(f), use blank hundredths grids to shade the given fractional part. Write the fraction as an equivalent decimal.

a. $\frac{1}{2}$ of the hundredths grid

b. $\frac{3}{4}$ of the hundredths grid

c. $\frac{99}{100}$ of the hundredths grid

d. $1\frac{3}{10}$ of the hundredths grids

e. $2\frac{7}{10}$ of the hundredths grids

f. $1\frac{3}{5}$ of the hundredths grids

Write a fraction equivalent to each decimal.

9. 0.08 **10.** 0.4 **11.** 0.04 **12.** 0.84

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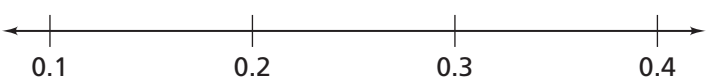
Write a decimal equivalent for each fraction.

13. $\frac{3}{4}$ **14.** $\frac{7}{50}$ **15.** $\frac{13}{25}$ **16.** $\frac{17}{25}$ **17.** $\frac{1}{20}$ **18.** $\frac{7}{10}$

For Exercises 19–21, copy the part of the number line given. Then find the "step" by determining the difference from one mark to another. Label the unlabeled marks with decimal numbers.

Sample

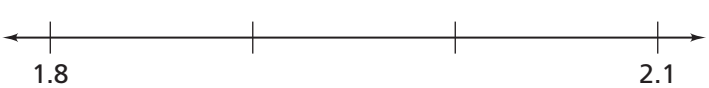


The step is 0.1.

19.

20.

21.



22. For each pair of numbers, find another number that is between them.

a. 0.7 and 0.75

b. 0.65 and 0.68

c. 1.4 and 1.410

d. 0.0322 and 0.323

23. Write each decimal in words.

a. 3.620 **b.** 0.14 **c.** 0.00002

24. Name each decimal as a fraction or mixed number.

a. 3.4 **b.** 0.35 **c.** 7.0003

25. For parts (a)–(c), use number lines to show the given fractional amount. Write the fraction as an equivalent decimal.

a. $\frac{20}{25}$ **b.** $\frac{5}{8}$ **c.** $\frac{13}{26}$

26. Pilar divided 1 by 9 on her calculator and found that $\frac{1}{9}$ was approximately 0.1111. Find decimal approximations for each of the following fractions.

a. $\frac{2}{9}$ **b.** $\frac{11}{9}$ **c.** $\frac{6}{9}$ **d.** $\frac{2}{3}$

e. Describe any patterns that you see.

27. Ella says that she can find the decimal equivalent for lots of fractions because she knows that the decimal equivalent for $\frac{1}{5}$ is 0.2. Name three fractions for which Ella could find the decimal equivalent. Explain how Ella would use $\frac{1}{5}$ to find the decimal for each fraction.

28. Which fraction benchmark below is each decimal nearest?

$\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{4}$ $\frac{1}{5}$ $\frac{1}{6}$ $\frac{1}{8}$ $\frac{1}{10}$

a. 0.30 **b.** 0.50 **c.** 0.12333 **d.** 0.15

29. a. Sarah and her uncle, Takota, went fishing in the Grand River, and each caught one fish. Sarah's fish was $\frac{5}{8}$ of a foot long and Takota's was $\frac{2}{3}$ of a foot long. Which fish is longer? Explain.

b. If Sarah and Takota measured their fish in decimals, would it be easier for them to tell which fish is longer? Explain.

30. Belinda used her calculator to find the decimal for the fraction $\frac{21}{28}$. When she entered 21 ÷ 28, the calculator gave an answer that looked familiar. Why do you think she recognized it?

31. **Multiple Choice** The orchestra at Johnson School is responsible for cleaning a 15-mile section of highway. There are 45 students in the orchestra. If each orchestra member cleans an equal section, what decimal represents this section?

A. 0.3 **B.** 0.33 **C.** 0.3333 . . . **D.** 3.0

32. Suppose a new student starts school today and your teacher asks you to teach her how to find decimal equivalents for fractions. What would you tell her? How would you convince her that your method works?

Copy each pair of numbers in Exercises 33–42. Insert <, >, or = to make a true statement.

33. 0.205 ■ 0.21

34. 0.1 ■ 0.1000

35. 0.04 ■ 0.050

36. 1.03 ■ 0.03

37. $\frac{5}{10}$ ■ 0.6

38. $\frac{3}{5}$ ■ 0.3

39. 0.4 ■ $\frac{2}{5}$

40. 0.7 ■ $\frac{1}{2}$

41. 0.52 ■ $\frac{2}{4}$

42. 0.41 ■ 0.405

43. For each pair of numbers in Exercises 33–42, write a number that is between the two given numbers. If this is not possible, explain why.

44. Which is greater, 0.45 or 0.9? Explain your reasoning. Draw a picture if it helps explain your thinking.

45. Which is greater, seventy-five hundredths or six tenths? Explain. Draw a picture if needed.

46. Which is greater, 0.6 or 0.60? Explain. Draw a picture if needed.

For Exercises 47–50, rewrite the numbers in order from least to greatest.

47. 0.33, 0.12, 0.127, 0.2, $\frac{45}{10}$

48. $\frac{45}{10}$, $\frac{3}{1{,}000}$, 0.005, 0.34

49. 0.418, $\frac{4}{10}$, $\frac{40}{1{,}000}$, 0.481

50. 0.827, 1.23, $\frac{987}{100}$, $\frac{987}{1{,}000}$

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Connections

51. Ten students went to a pizza parlor together. They ordered eight small pizzas.

a. How much will each student receive if they share the pizzas equally? Express your answer as a fraction and as a decimal.

b. Explain how you thought about the problem. Draw a picture that would convince someone that your answer is correct.

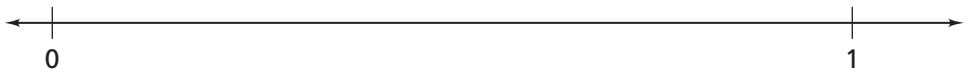
52. If you look through a microscope that makes objects appear ten times larger, 1 centimeter on a metric ruler looks like this:

a. Copy this microscope's view of 1 cm. Divide the length for 1 cm into ten equal parts. What fraction of the "centimeter" does each of these parts represent?

b. Now think of dividing one of these smaller parts into ten equal parts. What part of the original "centimeter" does each of the new segments represent?

c. If you were to divide one of these new small parts into ten parts again, what part of the original "centimeter" would each of the new small parts represent?

53. Copy the number line below. Show 0.4 and 0.5 on your number line.



a. Can you place five numbers between 0.4 and 0.5? If yes, place them on your number line with labels. If no, explain why not.

b. Now, enlarge the line segment from 0.4 to 0.5. Make your new line segment approximately the length of the original number line. Place 0.4, 0.45, and 0.50 on your new number line. Can you find five numbers that belong between 0.45 and 0.50? If yes, place them on your number line with labels. If no, explain why not.

54. Hana says division should be called a "sharing operation." Why might she say this?

Extensions

For Exercises 55–60, find an estimate if you cannot find an exact answer. You may find that drawing a number line, a hundredths grid, or some other diagram is useful in solving the problem. Explain your reasoning.

55. What is $\frac{1}{4}$ of 12?

56. What is $\frac{3}{4}$ of 8?

57. What is $\frac{2}{9}$ of 18?

58. What is $\frac{2}{9}$ of 3?

59. What is $\frac{1}{4}$ of 3?

60. What is $\frac{3}{4}$ of 3?