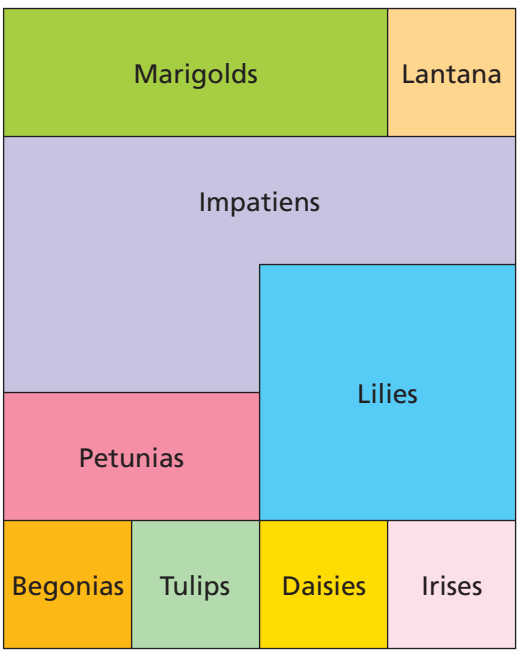
Applications Connections Extensions

ACE

Applications

1. The Langstons planted a big garden with flowers to sell to florists.



a. What fraction of the garden is planted with each type of flower?

b. How much more of the garden is planted with lilies than daisies?

c. Suppose the Langstons replace the daisies and irises with lilies. What fraction of the garden would be planted with lilies?

d. Use fractions to explain whether the following sentence is correct or incorrect.

The plots used for growing marigolds and petunias are equivalent to the plot used to grow impatiens.

e. Use fractions to explain whether the following sentence is correct or incorrect.

$$\text{Marigolds} - \text{Begonias} = \text{Petunias} + \text{Tulips}$$

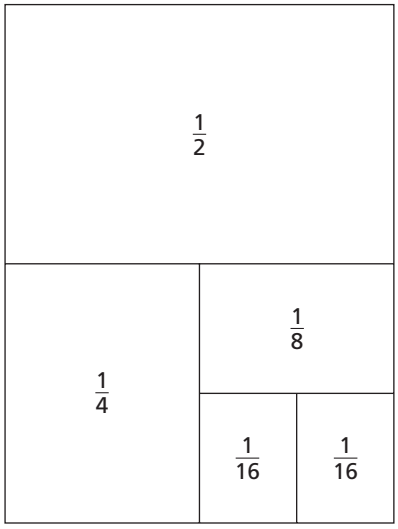
f. Look at the original garden plan. Find three different combinations of plots that total the fraction of the garden planted with impatiens. Write a number sentence for each combination.

2. A local magazine sells space for ads. It charges advertisers according to the fraction of a page each ad fills.

a. Advertisers purchase $\frac{1}{8}$ and $\frac{1}{16}$ of a page. What fraction of the page is used for ads?

b. What fraction of the page remains for other uses? Explain.

Sample Magazine Page



3. The Cool Sub Shop is having its grand opening. The owner buys three $\frac{1}{4}$-page ads, four $\frac{1}{8}$-page ads, and ten $\frac{1}{16}$-page ads. What is the total amount of ad space that the owner buys?

4. A local concert promoter purchases $2\frac{3}{4}$ pages of ads. When one of the concerts is cancelled, the promoter cancels $1\frac{5}{8}$ pages of ads. How much advertising space is the concert promoter actually using?

5. Rico and his friend eat part of a pan of lasagna. Rico eats $\frac{1}{16}$ of the lasagna, and his friend eats $\frac{1}{32}$ of the lasagna. How much of the lasagna is left?

6. Suppose you eat $\frac{3}{4}$ of a pizza and then eat $\frac{1}{8}$ of another pizza of the same size. How much of a whole pizza do you eat altogether?

For Exercises 7–12, find each sum or difference.

7. $8\frac{11}{12} - 2\frac{3}{4}$ **8.** $4\frac{4}{9} + 1\frac{2}{9}$ **9.** $2\frac{1}{8} + 3\frac{3}{4} + 1\frac{1}{2}$

10. $2\frac{7}{9} + 6\frac{1}{3}$ **11.** $11\frac{1}{2} - 2\frac{2}{3}$ **12.** $1\frac{2}{5} + 1\frac{1}{3}$

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13. Find each sum. Describe any patterns that you see.

a. $\frac{1}{2} + \frac{1}{3}$ **b.** $\frac{2}{4} + \frac{2}{6}$ **c.** $\frac{6}{12} + \frac{4}{12}$

For Exercises 14–17, determine which sum or difference is greater. Show your work.

14. $\frac{2}{3} + \frac{5}{6}$ or $\frac{3}{4} + \frac{4}{5}$ **15.** $\frac{7}{6} - \frac{2}{3}$ or $\frac{3}{5} - \frac{5}{10}$

16. $\frac{1}{4} + \frac{5}{6}$ or $\frac{1}{5} + \frac{7}{8}$ **17.** $\frac{1}{16} + \frac{1}{12}$ or $\frac{5}{4} - \frac{4}{5}$

18. Write the complete fact family for $\frac{1}{16} + \frac{1}{12}$ and for $\frac{5}{4} - \frac{4}{5}$.

19. Find the value for N that makes each number sentence correct.

a. $\frac{2}{3} + \frac{3}{4} = N$ **b.** $\frac{3}{4} + N = \frac{4}{5}$ **c.** $N - \frac{3}{5} = \frac{1}{4}$

For Exercises 20–25, find each sum or difference.

20. $2\frac{5}{6} + 1\frac{1}{3}$ **21.** $15\frac{5}{8} + 10\frac{5}{6}$ **22.** $4\frac{4}{9} + 2\frac{1}{5}$

23. $6\frac{1}{4} - 2\frac{5}{6}$ **24.** $3\frac{1}{2} - 1\frac{4}{5}$ **25.** $4\frac{1}{3} - \frac{5}{12}$

26. Find each sum. Describe any patterns that you see.

a. $\frac{1}{2} + \frac{1}{4}$ **b.** $\frac{1}{3} + \frac{1}{6}$ **c.** $\frac{1}{4} + \frac{1}{8}$

d. $\frac{1}{5} + \frac{1}{10}$ **e.** $\frac{1}{6} + \frac{1}{12}$ **f.** $\frac{1}{7} + \frac{1}{14}$

27. Tony works at a pizza shop. He cuts two pizzas into eight equal sections each. Customers then eat $\frac{7}{8}$ of each pizza. Tony says that $\frac{7}{8} + \frac{7}{8} = \frac{14}{16}$, so $\frac{14}{16}$ of all the pizza was eaten. Is Tony's addition correct? Explain.

For: Help with Exercise 27
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Connections

28. Suppose you select a number in the interval from $\frac{1}{2}$ to $\frac{3}{4}$ and a number in the interval from $\frac{3}{4}$ to $1\frac{1}{4}$. What is the least their sum can be? What is the greatest their sum can be? Explain your reasoning. (Note: The numbers $\frac{1}{2}$ and $\frac{3}{4}$ are included in the interval from $\frac{1}{2}$ to $\frac{3}{4}$.)

29. One number is near the benchmark $\frac{1}{4}$, and another is near the benchmark $1\frac{1}{2}$. Estimate their sum. Explain.

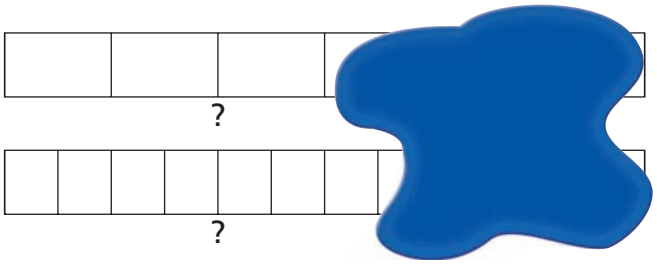
For Exercises 30–35, find a value for N that will make the sentence true.

30. $\frac{3}{12} = \frac{N}{8}$ **31.** $\frac{N}{4} = \frac{6}{8}$ **32.** $\frac{1}{2} = \frac{N}{12}$

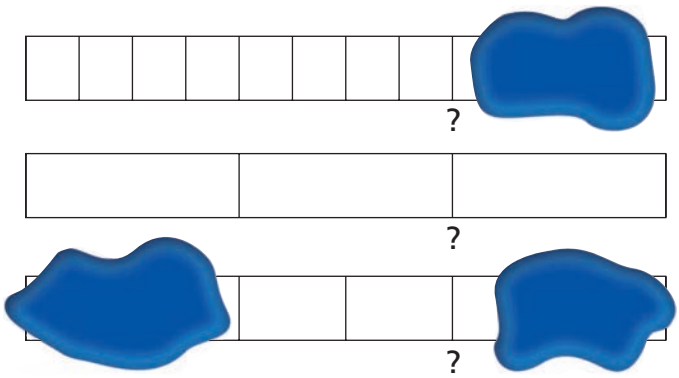
33. $\frac{N}{12} = \frac{2}{3}$ **34.** $\frac{N}{8} = \frac{14}{16}$ **35.** $\frac{5}{12} = \frac{10}{N}$

In Exercises 36–38, paint has spilled on the page, covering part of the fraction strips. Use what is showing to reason about each set of strips. Find the equivalent fractions indicated by the question marks.

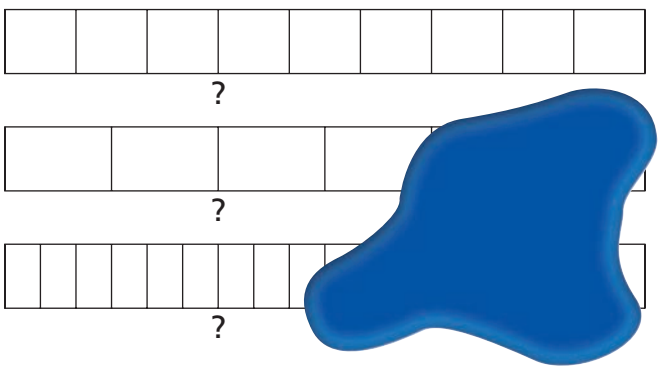
36.



37.



38.



For Exercises 39 and 40, use the map of Tupelo Township from Problem 2.1.

39. **Multiple Choice** Choose the combination of landowners who together own exactly one hundred percent of a section.

A. Burg, Lapp, Wong, Fuentes, and Bouck

B. Burg, Lapp, Fuentes, Bouck, Wong, Theule, and Stewart

C. Lapp, Fitz, Foley, and Walker

D. Walker, Foley, Fitz, and Fuentes

40. Find two different combinations of landowners whose land is equal to 1.25 sections of land. Write number sentences to show your solutions.

Copy each pair of numbers in Exercises 41–44. Insert <, >, or = to make a true statement.

41. 18.156 ■ 18.17

42. 3.184 ■ 31.84

43. 5.78329 ■ 5.78239

44. 4.0074 ■ 4.0008

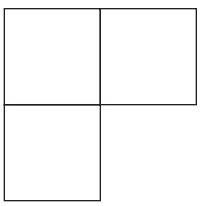
45. When solving $\frac{7}{15} + \frac{2}{10}$, Maribel writes $\frac{70}{150} + \frac{30}{150}$.

a. Show why $\frac{70}{150} + \frac{30}{150}$ is equivalent to $\frac{7}{15} + \frac{2}{10}$.

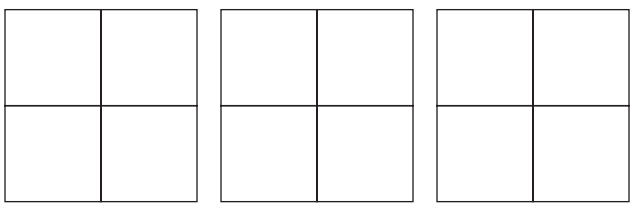
b. Write two more addition problems that are equivalent to $\frac{7}{15} + \frac{2}{10}$.

c. Of the three problems, Maribel's and the two you wrote, which one do you think will be the easiest to use to find the sum? Why?

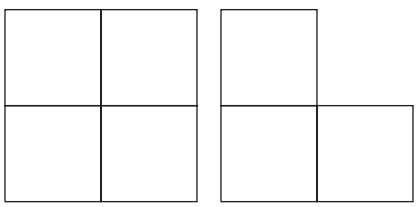
46. The model at the right represents $\frac{1}{3}$ of a whole. Use the model to name the amounts shown in parts (a) and (b).



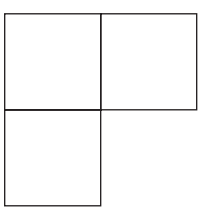
a.



b.



47. The following model represents one whole.



a. Draw a picture to represent $1\frac{1}{3} + \frac{1}{6}$.

b. Draw a picture to represent $2\frac{2}{3} - \frac{4}{3}$.

Extensions

48. *The Spartan* magazine wants to charge \$160 for each full page of advertising.

a. Develop a pricing plan to show the cost for each size ad shown below. Explain.

$\frac{1}{32}$ page, $\frac{1}{16}$ page, $\frac{1}{8}$ page, $\frac{1}{4}$ page, $\frac{1}{2}$ page, 1 page

b. Use the pricing plan you developed. What is the bill for the Cool Sub Shop if the owner purchases three $\frac{1}{4}$-page ads, four $\frac{1}{8}$-page ads, and a $\frac{1}{16}$-page ad?

c. The senior class is raising money for their senior trip. They have \$80 to spend on advertising. Geraldo says they can purchase two $\frac{1}{8}$-page ads and four $\frac{1}{16}$-page ads with their money. According to your pricing plan in part (a), is he correct? Explain.

d. Use your pricing plan from part (a). Find four different sets of ad sizes that the senior class can purchase for \$80. Show why your answers are correct.

49. **a.** Find a number for each denominator to make the sentence true. If necessary, you may use a number more than once.

$$\frac{1}{\blacksquare} - \frac{1}{\blacksquare} = \frac{1}{\blacksquare}$$

b. Find another set of numbers that works.

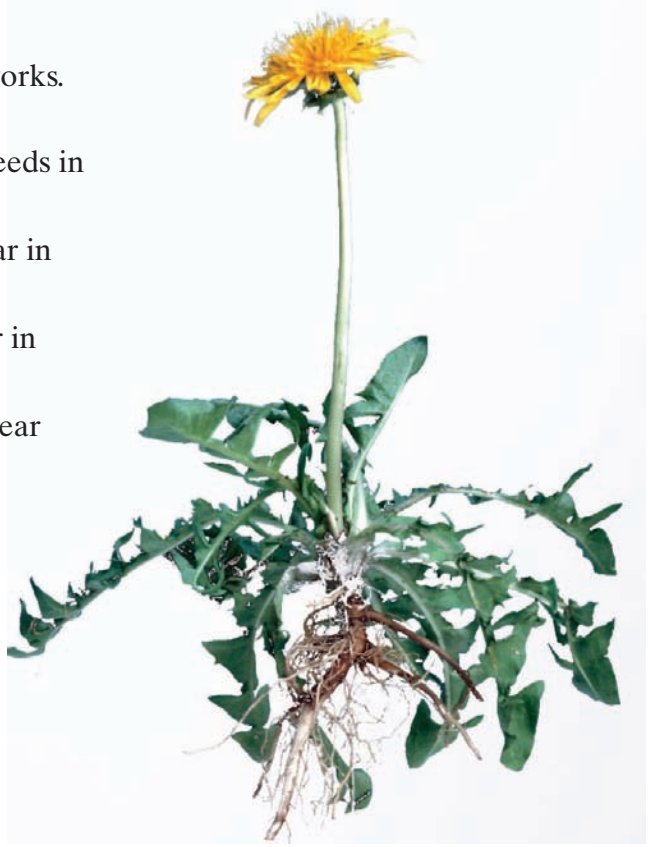
50. It takes 8 people to clear an acre of weeds in 4 hours.

a. How many acres can 16 people clear in 4 hours?

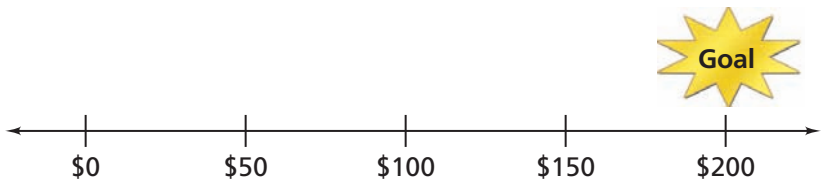
b. How many acres can 2 people clear in 4 hours?

c. How many people are needed to clear 3 acres in 4 hours?

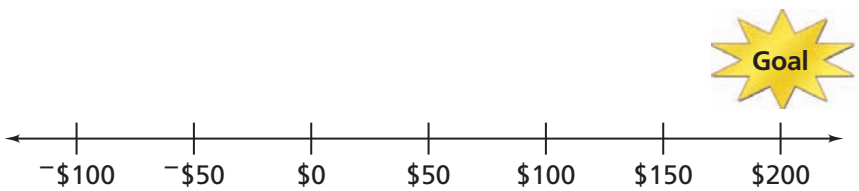
d. How many people are needed to clear 3 acres in 2 hours?



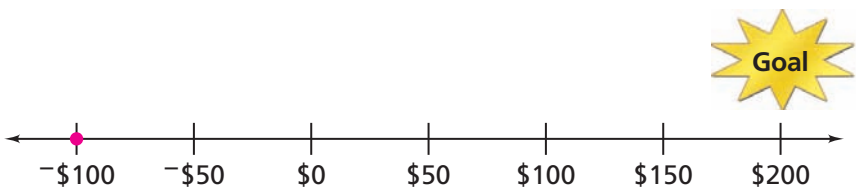
51. The sixth-grade students at Cleveland Middle School are selling popcorn as a fundraiser. They keep track of their progress using a number line like the one below:



After Day 2, the students have not sold enough popcorn to make up for the money they spent getting started. Ms. Johnson suggests they change their number line to look like this:



a. The students then plot this point to show their progress:

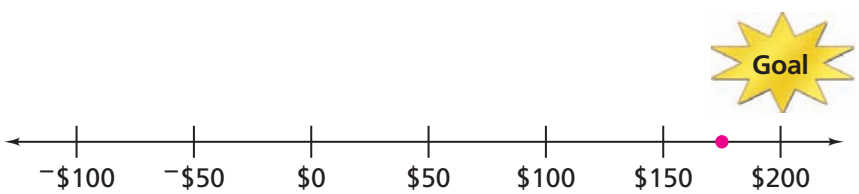


How much money have the sixth-graders lost?

b. After Day 4, the sixth-graders are doing better. They have lost a total of $25. Mark this point on a copy of the number line.

c. After Day 6, the sixth-graders are breaking even. This means they are no longer losing any money, but they are not gaining any money either. Mark their progress on your number line.

d. At the end of the fundraiser, the sixth-graders' number line looks like the one below. How much money have they raised?



e. What fraction of their goal did they raise after they broke even?