

1

List the 5 smallest whole numbers that are

- a. multiples of 4 and not multiples of 2.
- b. multiples of 43 and odd.
- c. even and not multiples of 4.

ANSWER: a. impossible; b. 43, 129, 215, 301, 387;
c. 2, 6, 10, 14, 18

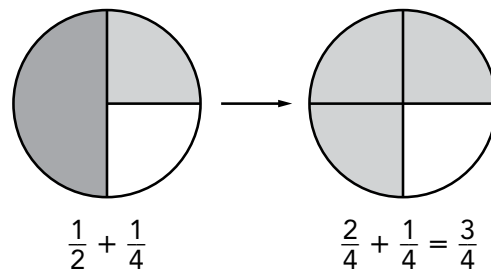
COMMENTS & EXTENSIONS: Part a has no answer. Every multiple of 4 is a multiple of 2. In Part b alternating multiples fit: 43, 86, 129, 172, 215, etc. Similarly, in Part c the answer is alternating even numbers: 2, 4, 6, 8, 10, 12, 14, 16, 18, etc.



Describe a pattern for your answers in Parts a to c. Use this pattern to find the next 5 numbers that fit.

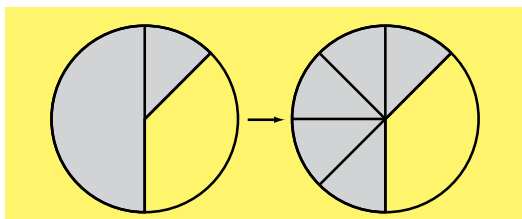
Try This

- Use Fraction Circles to model and draw the addition problem.
- Cover up the original Fraction Circles so that all the Fraction Circles are the same color.
- Draw the problem with like denominators.
- Write the problem using equivalent fractions.
- Find the sum.

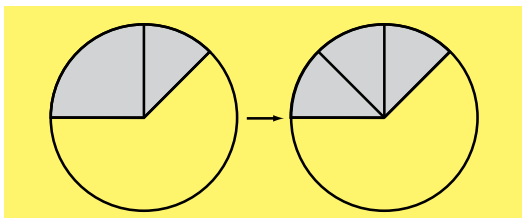


Problem Equivalent Fractions Sum

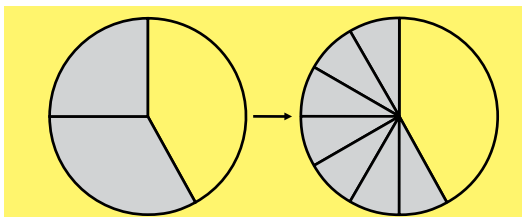
1. $\frac{1}{2} + \frac{1}{8} = \frac{4}{8} + \frac{1}{8} = \frac{5}{8}$



2. $\frac{1}{8} + \frac{1}{4} = \frac{1}{8} + \frac{2}{8} = \frac{3}{8}$



3. $\frac{1}{3} + \frac{1}{4} = \frac{4}{12} + \frac{3}{12} = \frac{7}{12}$

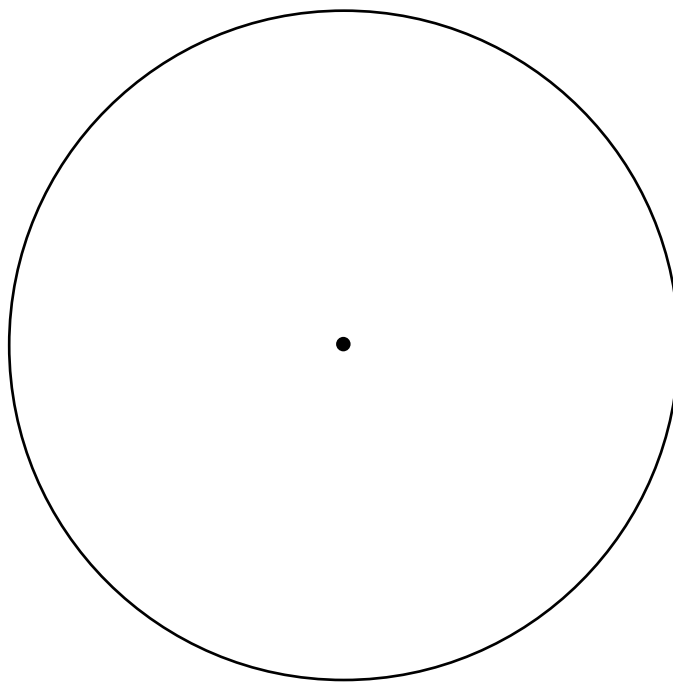


4. $\frac{1}{4} + \frac{3}{8} = \frac{2}{8} + \frac{3}{8} = \frac{5}{8}$

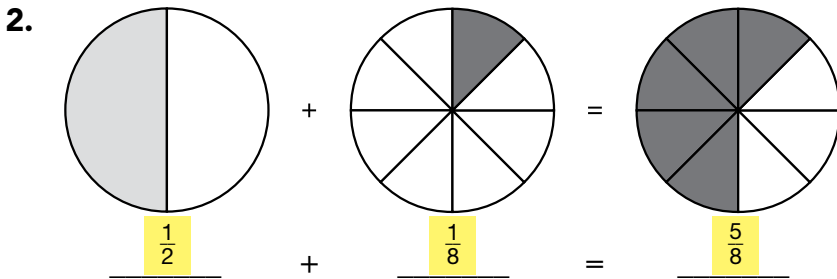
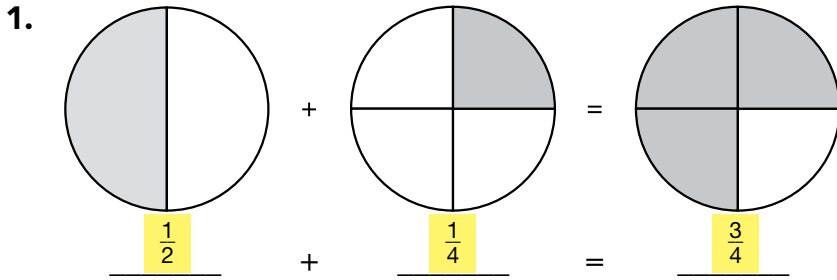
6. $\frac{3}{8} + \frac{1}{2} = \frac{3}{8} + \frac{4}{8} = \frac{7}{8}$

5. $\frac{1}{8} + \frac{3}{4} = \frac{1}{8} + \frac{6}{8} = \frac{7}{8}$

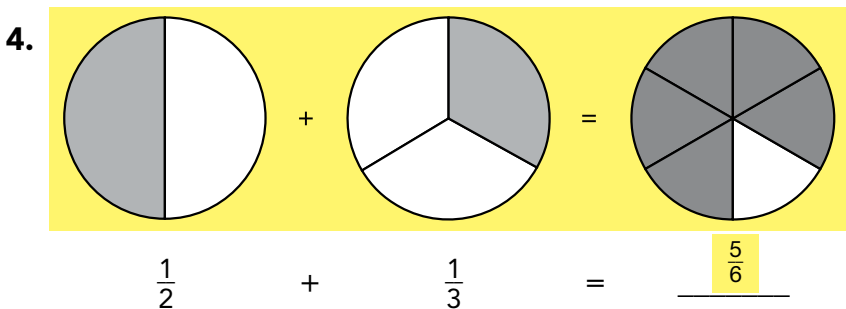
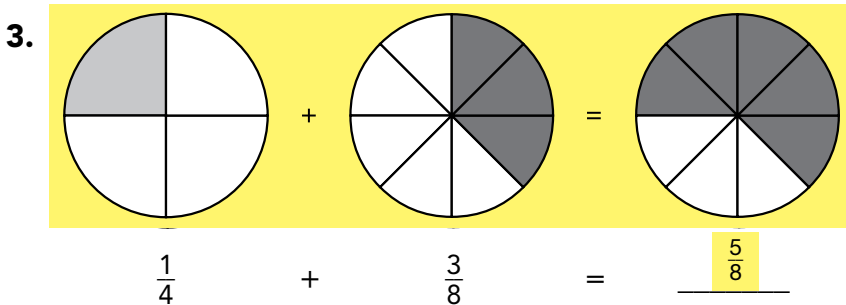
7. $\frac{2}{3} + \frac{1}{4} = \frac{8}{12} + \frac{3}{12} = \frac{11}{12}$



Use Fraction Circles to build the model. Write the addends and the sum.



Use Fraction Circles to model the addition problem. Draw the model by shading the circles. Write the sum.



Find each sum.

5. $\frac{2}{6} + \frac{1}{2} = \frac{5}{6}$

7. $\frac{2}{3} + \frac{1}{6} = \frac{5}{6}$

9. $\frac{1}{2} + \frac{1}{5} = \frac{7}{10}$

6. $\frac{1}{5} + \frac{1}{10} = \frac{3}{10}$

8. $\frac{3}{5} + \frac{1}{10} = \frac{7}{10}$

10. $\frac{1}{4} + \frac{2}{3} = \frac{11}{12}$

Name Answer Key

2

Put the fractions in order from least to greatest.

$$\frac{3}{2}$$

$$\frac{1}{3}$$

$$\frac{1}{2}$$

$$\frac{1}{4}$$

ANSWER: $\frac{1}{4}, \frac{1}{3}, \frac{1}{2}, \frac{3}{2}$

COMMENTS & EXTENSIONS: There are several ways to put fractions in order. One way is to compare parts on fraction models. Another way is to compare parts on a number line.



Do these series have equal “jumps” between numbers?

a. 1, 2, 3, 4, 5

b. $\frac{1}{5}, \frac{2}{5}, \frac{3}{5}, \frac{4}{5}, 1$

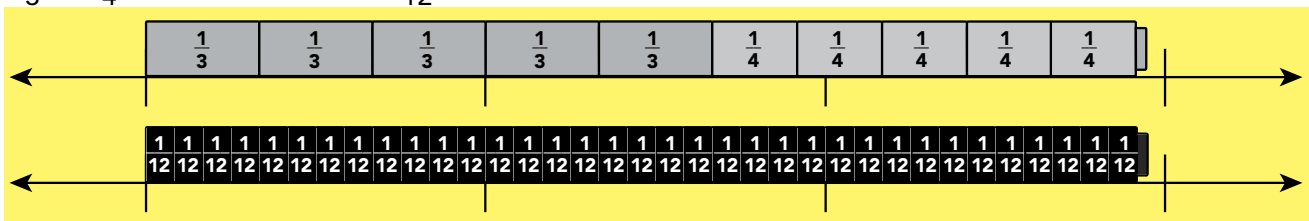
c. $1, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}$



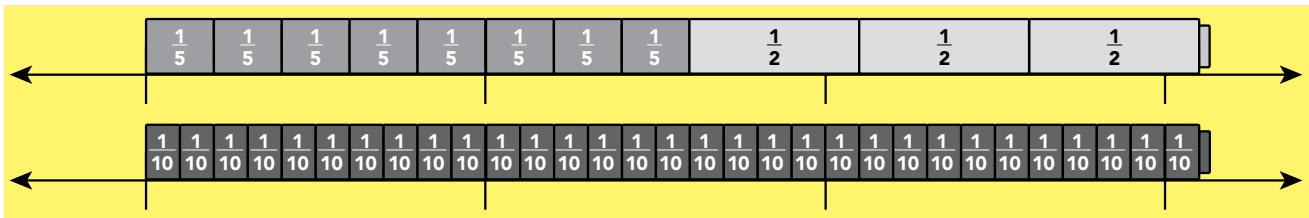
Try This

- Use Fraction Towers and the double-line Fraction Number Line.
- On the top number line:
Rename the mixed numbers as improper fractions and model their sum.
- On the bottom number line:
Find a Fraction Tower to model a common denominator. Use it with a dry erase marker to draw a model of the sum.
- Sketch your model below and fill in the blanks.

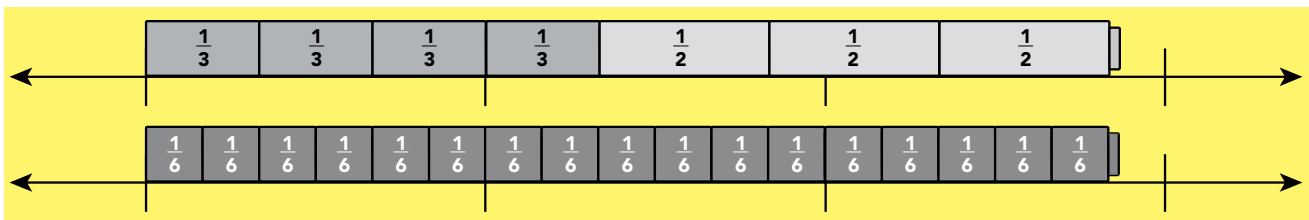
1. $1\frac{2}{3} + 1\frac{1}{4} = \frac{5}{3} + \frac{5}{4} = \frac{35}{12} = 2\frac{11}{12}$



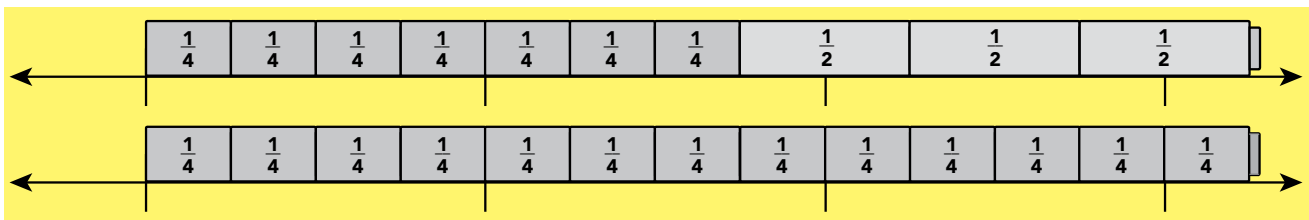
2. $1\frac{3}{5} + 1\frac{1}{2} = \frac{8}{5} + \frac{3}{2} = \frac{31}{10} = 3\frac{1}{10}$



3. $1\frac{1}{3} + 1\frac{1}{2} = \frac{4}{3} + \frac{3}{2} = \frac{17}{6} = 2\frac{5}{6}$



4. $1\frac{3}{4} + 1\frac{1}{2} = \frac{7}{4} + \frac{3}{2} = \frac{13}{4} = 3\frac{1}{4}$



Find the sum. Write your answer as a mixed number.

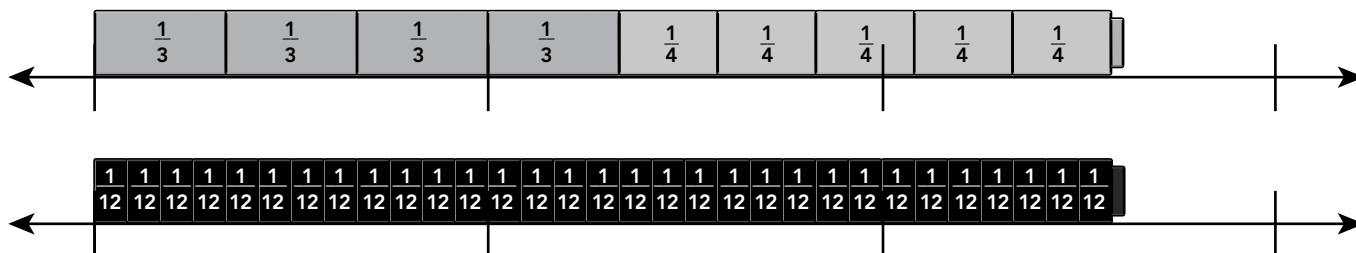
5. $1\frac{2}{5} + 1\frac{1}{3} = 2\frac{11}{15}$

6. $1\frac{1}{3} + 1\frac{3}{4} = 3\frac{1}{12}$

7. $\frac{5}{8} + 1\frac{1}{4} = 1\frac{7}{8}$

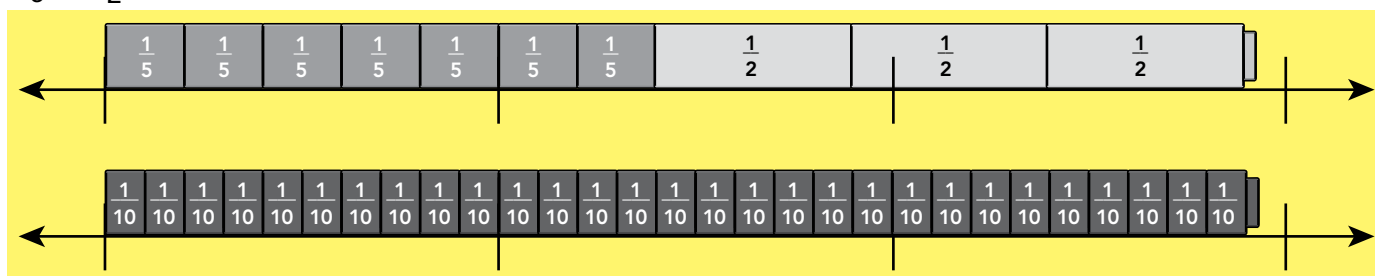
Use Fraction Towers and the double-line Fraction Number Line to model the addition problem. Fill in the blanks.

1. $1\frac{1}{3} + 1\frac{1}{4} = \frac{4}{3} + \frac{5}{4} = \frac{31}{12} = 2\frac{7}{12}$

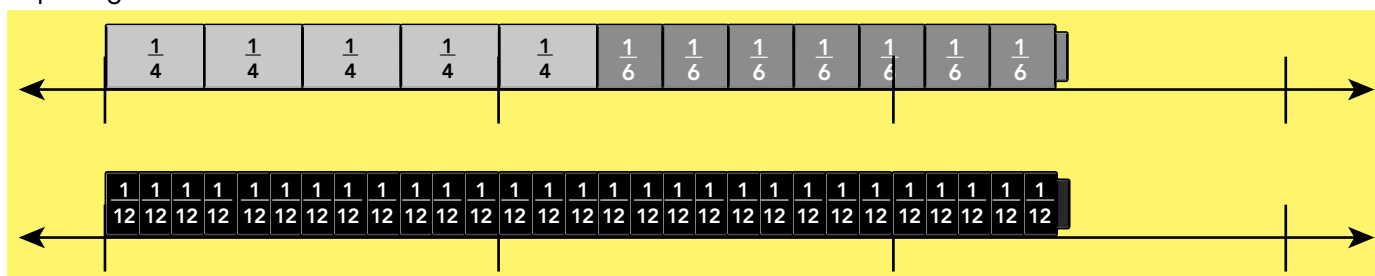


Use Fraction Towers and the double-line Fraction Number Line to model the addition problem. Draw the model. Fill in the blanks.

2. $1\frac{2}{5} + 1\frac{1}{2} = \frac{7}{5} + \frac{3}{2} = \frac{29}{10} = 2\frac{9}{10}$



3. $1\frac{1}{4} + 1\frac{1}{6} = \frac{5}{4} + \frac{7}{6} = \frac{29}{12} = 2\frac{5}{12}$



Find the sum. Write your answer as a mixed number.

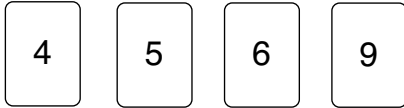
4. $1\frac{1}{5} + 1\frac{1}{3} = 2\frac{8}{15}$

5. $2\frac{1}{2} + 1\frac{2}{3} = 4\frac{1}{6}$

6. $1\frac{1}{3} + 2\frac{1}{4} = 3\frac{7}{12}$

3

Four number cards are shown below. Use two cards to make a fraction like



—

- a. Make the smallest possible fraction.
- b. Make the largest possible fraction.
- c. Make the fraction closest to 2.
- d. Make the fraction closest to 1.

ANSWER: a. $\frac{4}{9}$; b. $\frac{9}{4}$; c. $\frac{9}{5}$; d. $\frac{5}{6}$

COMMENTS & EXTENSIONS: Why is zero not an allowable denominator? [Because fractions get their meaning from division and division gets its meaning from multiplication, $\frac{6}{2}$ is 3 because three 2s is 6. $\frac{6}{0}$ is meaningless because there is no number one can multiply by 0 to get 6.]



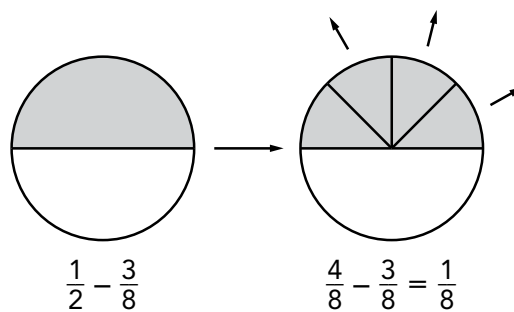
Which fraction is larger?

- a. $\frac{3}{5}$ or $\frac{1}{2}$
- b. $\frac{4}{7}$ or $\frac{3}{7}$
- c. $\frac{5}{8}$ or $\frac{7}{9}$



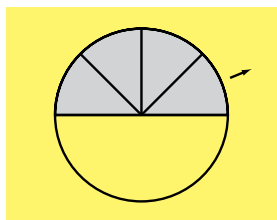
Try This

- Use Fraction Circles to model and draw the subtraction problem.
- Cover up the original Fraction Circles with common same-color fraction pieces. Draw the problem with like denominators.
- Write the problem using equivalent fractions.
- Find the difference. Simplify, if needed.

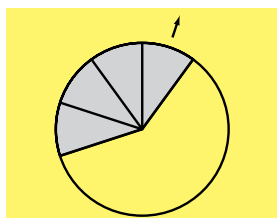


Problem Equivalent Fractions Difference

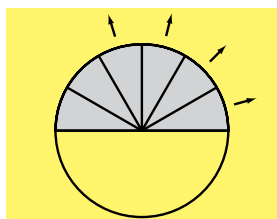
1. $\frac{1}{2} - \frac{1}{8} = \frac{4}{8} - \frac{1}{8} = \frac{3}{8}$



2. $\frac{2}{5} - \frac{1}{10} = \frac{4}{10} - \frac{1}{10} = \frac{3}{10}$



3. $\frac{1}{2} - \frac{4}{12} = \frac{6}{12} - \frac{4}{12} = \frac{2}{12} = \frac{1}{6}$

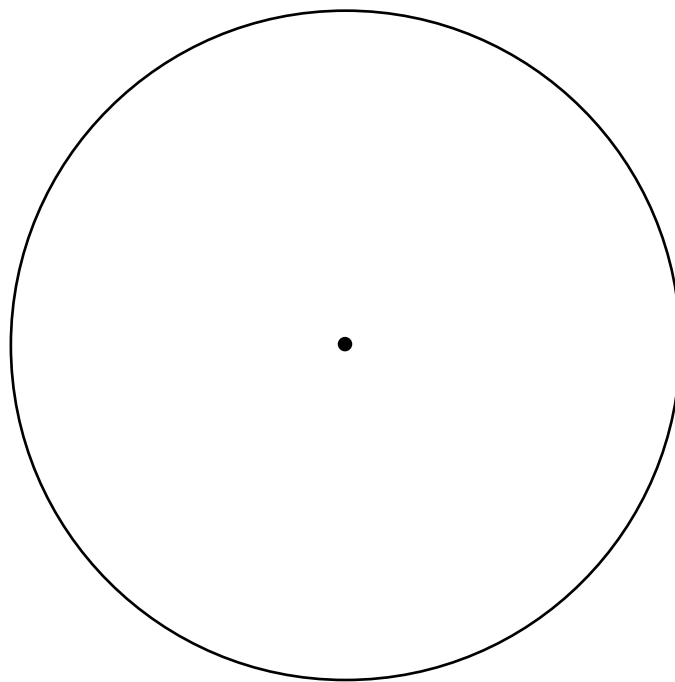


4. $\frac{9}{10} - \frac{1}{2} = \frac{9}{10} - \frac{5}{10} = \frac{4}{10} = \frac{2}{5}$

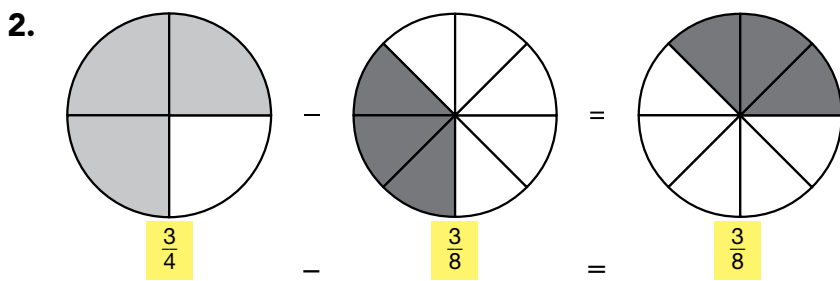
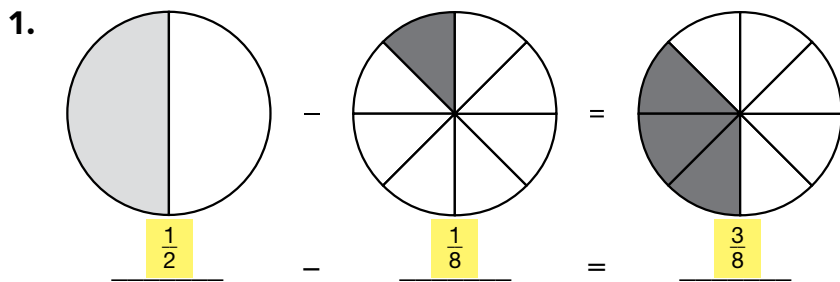
6. $\frac{5}{6} - \frac{1}{2} = \frac{5}{6} - \frac{3}{6} = \frac{2}{6} = \frac{1}{3}$

5. $\frac{2}{3} - \frac{1}{6} = \frac{4}{6} - \frac{1}{6} = \frac{3}{6} = \frac{1}{2}$

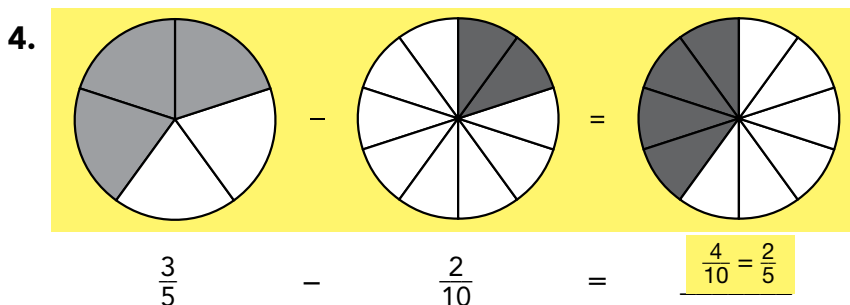
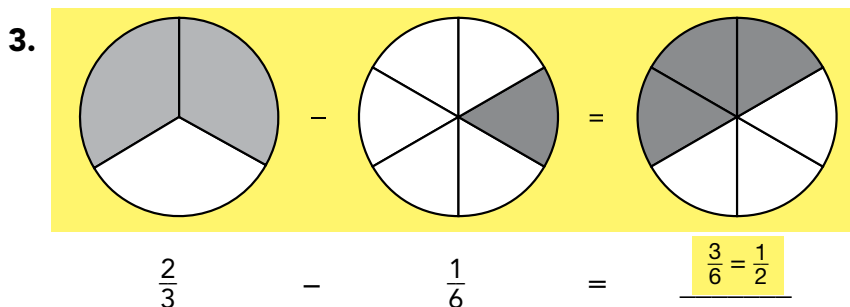
7. $\frac{2}{3} - \frac{5}{12} = \frac{8}{12} - \frac{5}{12} = \frac{3}{12} = \frac{1}{4}$



Use Fraction Circles to build the model. Write the missing numbers and the difference.



Use Fraction Circles to model the subtraction problem. Draw the model by shading the circles. Write the difference. Simplify the answer if possible.



Find each difference. Write the answer in simplest form, if possible.

5. $\frac{5}{6} - \frac{3}{12} = \frac{7}{12}$

7. $\frac{4}{5} - \frac{3}{10} = \frac{5}{10} = \frac{1}{2}$

9. $\frac{7}{8} - \frac{3}{4} = \frac{1}{8}$

6. $\frac{1}{2} - \frac{1}{6} = \frac{2}{6} = \frac{1}{3}$

8. $\frac{2}{3} - \frac{1}{6} = \frac{3}{6} = \frac{1}{2}$

10. $\frac{2}{3} - \frac{2}{12} = \frac{6}{12} = \frac{1}{2}$

Name Answer Key

4

Suppose you have five cards with these numbers on them. Use four cards to make the largest fraction of the form:

<hr/>	

1

2

3

4

5

ANSWER: $\frac{54}{12}$

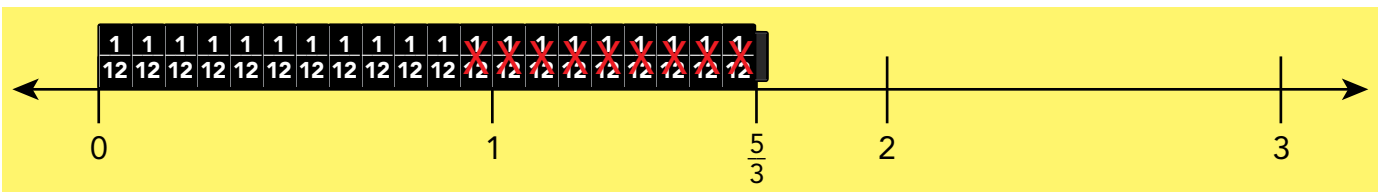
COMMENTS & EXTENSIONS: The largest fraction, in general, should have the biggest numerator and the smallest denominator. Zero is not allowed as a denominator. Challenge students to come up with the smallest fraction.



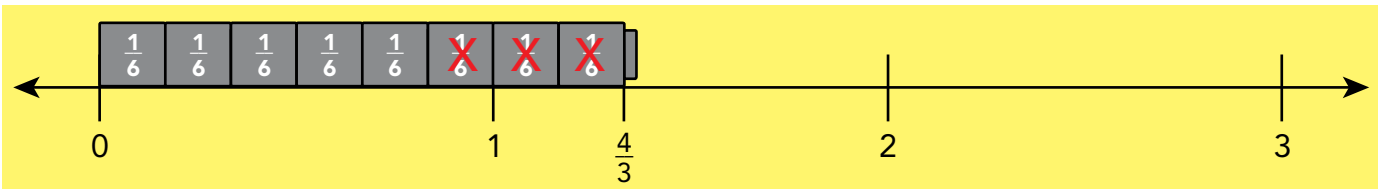
Try This

- Rename the mixed numbers as improper fractions.
- Write the fractions and build models using Fraction Towers.
- Find a common denominator. Use it to build a model of the first fraction.
- Draw the model on the blank Fraction Number Line using a dry erase marker.
- Subtract by crossing out fraction pieces on the drawing.
- Sketch the drawing below and finish filling in the blanks.

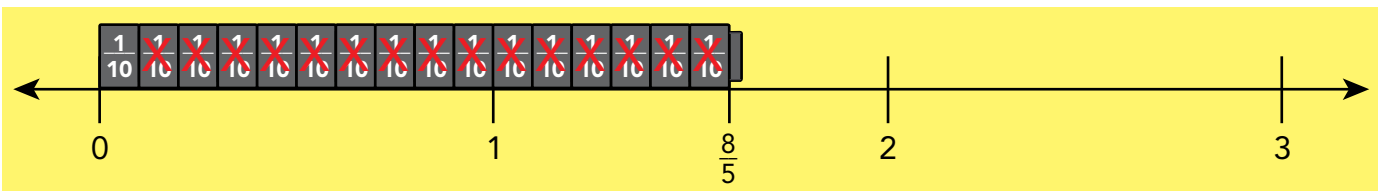
$$1. \quad 1\frac{2}{3} - \frac{3}{4} = \frac{5}{3} - \frac{3}{4} = \frac{20}{12} - \frac{9}{12} = \frac{11}{12}$$



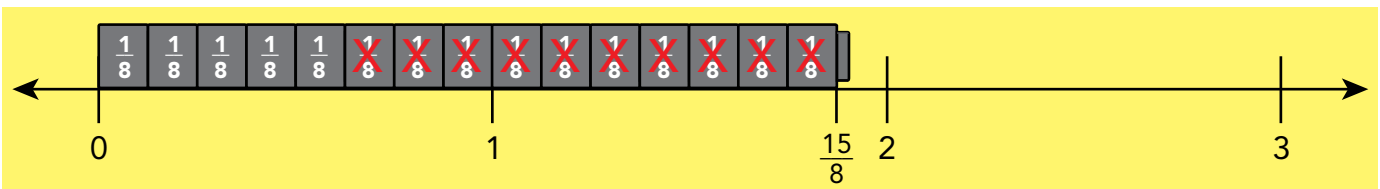
$$2. \quad 1\frac{1}{3} - \frac{1}{2} = \frac{4}{3} - \frac{1}{2} = \frac{8}{6} - \frac{3}{6} = \frac{5}{6}$$



$$3. \quad 1\frac{3}{5} - 1\frac{1}{2} = \frac{8}{5} - \frac{3}{2} = \frac{16}{10} - \frac{15}{10} = \frac{1}{10}$$



$$4. \quad 1\frac{7}{8} - 1\frac{1}{4} = \frac{15}{8} - \frac{5}{4} = \frac{15}{8} - \frac{10}{8} = \frac{5}{8}$$

**Find the difference.**

$$5. \quad 1\frac{5}{8} - 1\frac{1}{2} = \frac{1}{8}$$

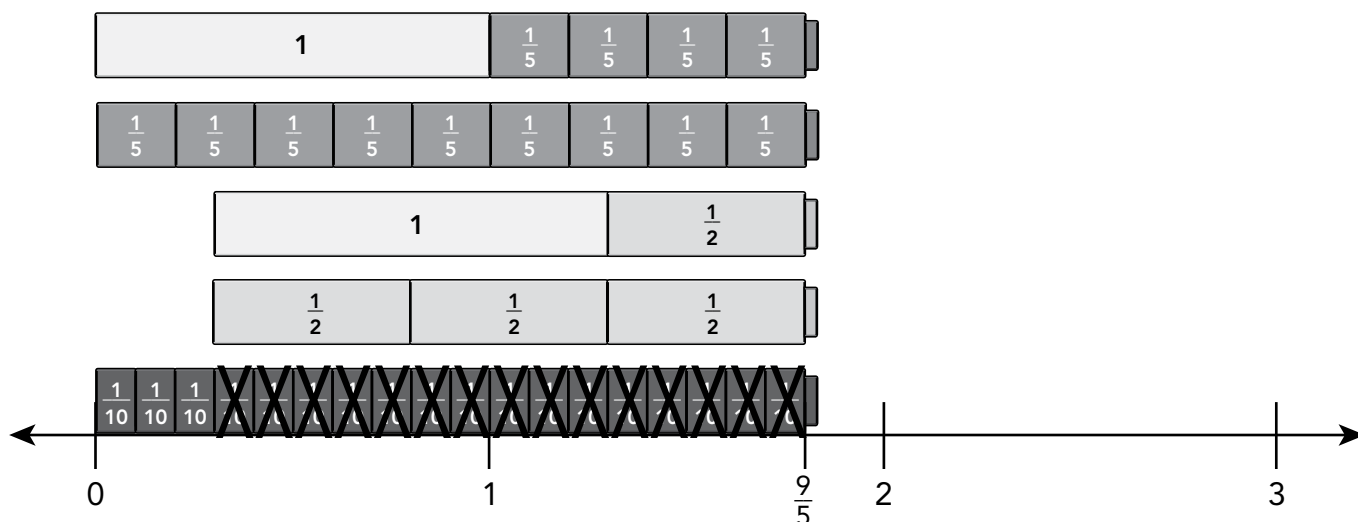
$$6. \quad 2\frac{2}{3} - \frac{1}{4} = \frac{2\frac{5}{12}}$$

$$7. \quad 2\frac{1}{2} - 1\frac{1}{3} = \frac{1\frac{1}{6}}$$



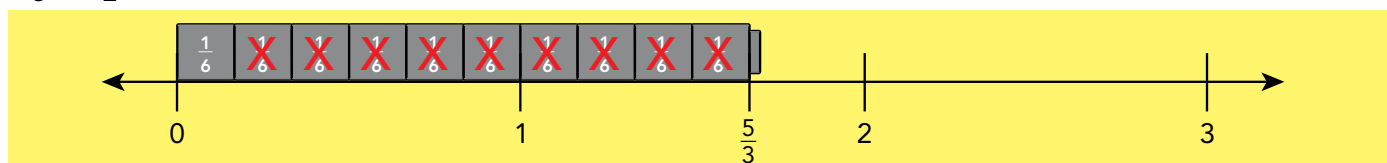
Use Fraction Towers and the blank Fraction Number Line to build the model. Write the difference.

1. $1\frac{4}{5} - 1\frac{1}{2} = \frac{9}{5} - \frac{3}{2} = \frac{18}{10} - \frac{15}{10} = \underline{\frac{3}{10}}$

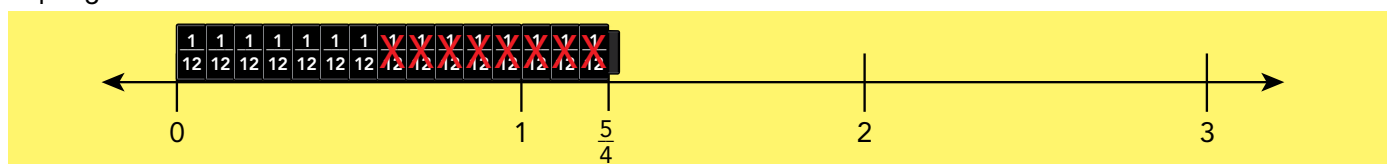


Use Fraction Towers and the blank Fraction Number Line to model the difference. Sketch the final step, when you subtract using a common denominator. Fill in the blanks.

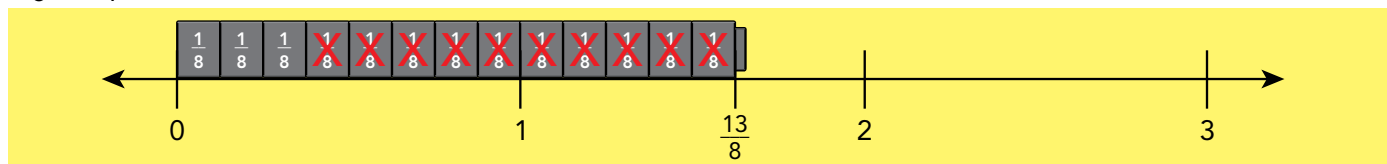
2. $1\frac{2}{3} - 1\frac{1}{2} = \underline{\frac{5}{6}} - \underline{\frac{3}{2}} = \underline{\frac{10}{6}} - \underline{\frac{9}{6}} = \underline{\frac{1}{6}}$



3. $1\frac{1}{4} - \frac{2}{3} = \underline{\frac{5}{12}} - \underline{\frac{2}{3}} = \underline{\frac{15}{12}} - \underline{\frac{8}{12}} = \underline{\frac{7}{12}}$



4. $1\frac{5}{8} - 1\frac{1}{4} = \underline{\frac{13}{8}} - \underline{\frac{5}{4}} = \underline{\frac{13}{8}} - \underline{\frac{10}{8}} = \underline{\frac{3}{8}}$



Find the difference.

5. $1\frac{1}{2} - 1\frac{3}{8} = \underline{\frac{1}{8}}$

6. $2\frac{1}{3} - \frac{1}{4} = \underline{2\frac{1}{12}}$

7. $2\frac{1}{2} - 1\frac{2}{3} = \underline{\frac{5}{6}}$

5

Invent a story problem for which the answer is

a. 10 remainder 4.

b. $10\frac{1}{2}$.

c. 100.7.

ANSWER: a. Sample: Amanda has 64 marbles and wants to divide them equally among her 6 cousins. How many marbles does each cousin get? b. Sample: Juan ran 400 yards in 42 seconds. What was his average time per 100 yards? c. Sample: When Rob had the flu, his temperature was 2.1° above normal. What was his temperature?

COMMENTS & EXTENSIONS: Once students have created one problem, challenge them to write a second problem.



Try This

- Write an addition or subtraction number sentence.
- Use Fraction Circles or Fraction Tower Cubes to model the problem, if needed.
- Show your work. Write the answers in simplest form.

1. Mark ate $\frac{3}{8}$ of a large cheese pizza and $\frac{1}{4}$ of a large sausage pizza. How much pizza did he eat?

$$\frac{3}{8} + \frac{1}{4} = \frac{3}{8} + \frac{2}{8} = \frac{5}{8} \text{ pizza}$$

2. At softball practice, Juan spent $\frac{1}{2}$ hour exercising and $\frac{5}{6}$ hour in the bullpen practicing pitching. How much more time did he spend in the bullpen?

$$\frac{5}{6} - \frac{1}{2} = \frac{5}{6} - \frac{3}{6} = \frac{2}{6} = \frac{1}{3} \text{ hour}$$

3. Paula bought a bag of apples that weighed $3\frac{1}{2}$ kilograms. She also bought a melon that weighed $\frac{3}{4}$ kilogram. What was the total weight of the fruit she bought?

$$3\frac{1}{2} + \frac{3}{4} = 3\frac{2}{4} + \frac{3}{4} = 4\frac{1}{4} \text{ kilograms}$$

4. Yvonne needs $\frac{2}{3}$ yard of fabric to make a fancy headband and $\frac{1}{6}$ yard of fabric to make a bow. How much fabric does she need to make both items?

$$\frac{2}{3} + \frac{1}{6} = \frac{4}{6} + \frac{1}{6} = \frac{5}{6} \text{ yard}$$

5. A grasshopper is $1\frac{1}{2}$ inches long. A ladybug is $\frac{3}{8}$ inches long. How much longer is the grasshopper?

$$1\frac{1}{2} - \frac{3}{8} = 1\frac{4}{8} - \frac{3}{8} = 1\frac{1}{8} \text{ inches}$$

6. A flag pin is $\frac{7}{8}$ inches long and $\frac{3}{4}$ inches wide. What is the perimeter of the pin?

$$\frac{7}{8} + \frac{3}{4} + \frac{7}{8} + \frac{3}{4} = \frac{7}{8} + \frac{6}{8} + \frac{7}{8} + \frac{6}{8} = \frac{26}{8} = 3\frac{2}{8} = 3\frac{1}{4} \text{ inches}$$

7. Joey spent $\frac{1}{3}$ of the day working. He spent $\frac{1}{6}$ of the day eating meals and $\frac{1}{4}$ of his day watching television. The rest of the day he slept. What part of the day did he sleep?

$$\frac{1}{3} + \frac{1}{6} + \frac{1}{4} = \frac{4}{12} + \frac{2}{12} + \frac{3}{12} = \frac{9}{12} = \frac{3}{4}, 1 - \frac{3}{4} = \frac{1}{4} \text{ day}$$

8. Janice baked a round cake. She cut it into 12 pieces. She ate 2 pieces. Kate ate 3 pieces and Karla ate 2 pieces. What fraction of the cake did they eat?

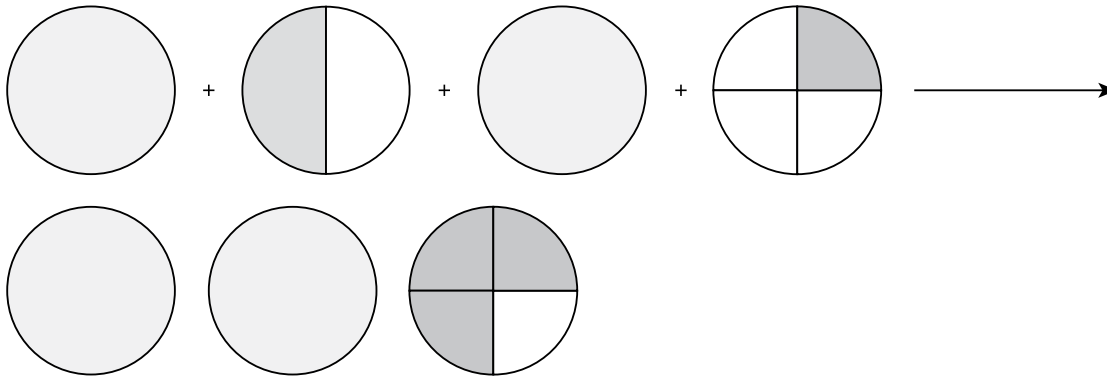
$$\frac{2}{12} + \frac{3}{12} + \frac{2}{12} = \frac{7}{12} \text{ cake}$$



Use Fraction Circles to build the model. Look at the model and write a number sentence to solve the problem.

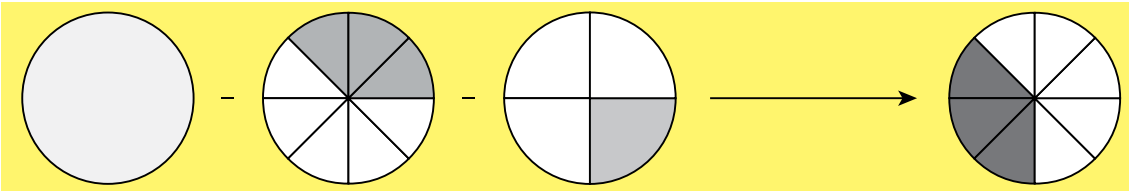
1. Molly ate $1\frac{1}{4}$ cheese pizzas. Sammy ate $1\frac{1}{2}$ of different, same-sized cheese pizzas. How much pizza did Molly and Sammy eat in all?

$$1 + \frac{1}{2} + 1 + \frac{1}{4} = 2\frac{3}{4} \text{ cheese pizzas}$$



2. Jose ate $\frac{3}{8}$ of a sausage pizza. Margaret ate $\frac{1}{4}$ of the same pizza. How much of the original pizza is left?

$$1 - \frac{3}{8} - \frac{1}{4} = \frac{3}{8} \text{ of the pizza}$$



Write a number sentence to solve the problem. Write the solution.

3. Hans made three same-sized pepperoni pizzas. He ate $\frac{1}{3}$ of one pizza, $\frac{1}{2}$ of another pizza, and $\frac{5}{6}$ of the third pizza. How much pizza was left?

$$3 - \frac{1}{3} - \frac{1}{2} - \frac{5}{6} = 1\frac{1}{3} \text{ pizzas}$$

4. There were $1\frac{2}{5}$ pizzas left on the kitchen table. Noah ate $\frac{7}{10}$ of a pizza. How much pizza is left?

$$1\frac{2}{5} - \frac{7}{10} = \frac{7}{10} \text{ of a pizza}$$

5. Nathan ate $\frac{5}{8}$ of a pizza. Jennifer ate $\frac{3}{4}$ of another, same-sized pizza. How much pizza did Nathan and Jennifer eat in all?

$$\frac{5}{8} + \frac{3}{4} = 1\frac{3}{8} \text{ pizzas}$$