APRIL 13TH

Subtract Decimals

Getting the Idea

You can subtract decimals the same way you subtract whole numbers. Just align the numbers on the decimal points and write a decimal point in the difference. Remember, when there are not enough units to subtract from, you will have to regroup 1 of the next greater unit as 10 of the lesser unit. For example, you can regroup 7 tenths 3 hundredths as 6 tenths 13 hundredths.

$$\begin{array}{r} {\scriptstyle 6\,13} \\ 1.\not{7}\not{3} \\ -\ 0.2\ 9 \\ \hline 1.4\ 4 \end{array}$$

Example 1

Find the difference.

$4.29 - 0.01 = \square$

Strategy **Use mental math.**

Think: What is 9 hundredths minus 1 hundredth?

$4.29 - 0.01 = 4.28$

Solution **$4.29 - 0.01 = 4.28$**

Example 2

Find the difference.

$1.7 - 0.93 = \square$

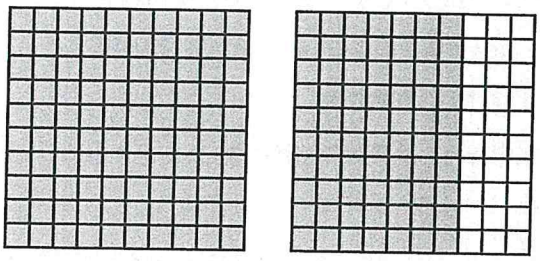
Strategy **Use models.**

Step 1 Model the greater decimal using grids.

1.7 is one and seven tenths, or one and seventy hundredths.

Use two grids and shade the first one completely.

Shade 70 squares in the second grid.

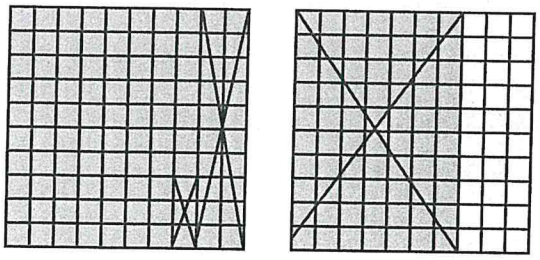


Step 2 Cross out squares to represent the number being subtracted.

0.93 is ninety-three hundredths, so cross out 93 of the shaded squares.

Cross out 70 shaded squares in the second grid.

Cross out 23 more in the first grid.



Step 3 Count the number of shaded squares that are not crossed out.

77 squares are shaded and not crossed out.

77 hundredths = 0.77

Solution **$1.7 - 0.93 = 0.77$**

Example 3

In 2010, Ms. Clark earned $528.56 per week. In 2000, she earned $390.73 per week. How much more did Ms. Clark earn per week in 2010 than in 2000?

Strategy **Write an equation for the problem. Then solve.**

Step 1 Write an equation for the problem.

Let n represent how much more was earned per week in 2010.

$\$528.56 - \$390.73 = n$

Step 2 Rewrite the problem.

Align the numbers on the decimal point.

Write the decimal point in the difference.

Subtract the hundredths.

6 hundredths − 3 hundredths = 3 hundredths

$$\begin{array}{r} \$528.56 \\ -\ 390.73 \\ \hline .\ 3 \end{array}$$

Step 3 Subtract the tenths.

Because 7 is greater than 5, regroup from the ones.

15 tenths − 7 tenths = 8 tenths

$$\begin{array}{r} {\scriptstyle 7\ 15} \\ \$528.56 \\ -\ 390.73 \\ \hline .83 \end{array}$$

Step 4 Subtract the ones.

7 ones − 0 ones = 7 ones

$$\begin{array}{r} {\scriptstyle 7\ 15} \\ \$528.56 \\ -\ 390.73 \\ \hline 7.83 \end{array}$$

Step 5 Subtract the tens.

Because 9 is greater than 2, regroup from the hundreds.

12 tens − 9 tens = 3 tens

$$\begin{array}{r} \$\not{5}\not{2}\not{8}.\not{5}6 \\ -\ 390.73 \\ \hline 37.83 \end{array}$$

Step 6 Subtract the hundreds.

4 hundreds − 3 hundreds = 1 hundred

Write the dollar sign in the difference.

$$\begin{array}{r} \$\not{5}\not{2}\not{8}.\not{5}6 \\ -\ 390.73 \\ \hline \$137.83 \end{array}$$

Solution **Ms. Clark earned $137.83 more per week in 2010 than in 2000.**

You can check the answer to a subtraction problem by using addition.

Since $137.83 + $390.73 = $528.56, the answer is correct.

Remember, you can **estimate** to check if answers are reasonable. If an estimate is not close to the actual answer, an error was made in finding the answer. You can estimate by rounding to the nearest whole number or nearest dollar.

Example 4

A bike trail is 36.25 miles long. Andrew stopped to rest after he had biked 13.8 miles of the trail. How many more miles must he ride to finish the trail?

Strategy **Estimate the distance. Then find the actual distance left.**

Step 1 Round each number to the nearest whole number. Then subtract.

36.25 rounds down to 36.

13.8 rounds up to 14.

36 miles − 14 miles = 22 miles

The difference should be about 22 miles.

Step 2 Find the actual distance.

Align the numbers on the decimal point. Insert a 0 to the right of 13.8 so that both decimals have the same number of places.

$$\begin{array}{r} {\scriptstyle 5\,12} \\ 3\not{6}.25 \\ -\ 13.80 \\ \hline 22.45 \end{array}$$

Step 3 Compare the actual answer to the estimate.

22.45 is close to 22.

22.45 is a reasonable answer.

Solution **Andrew must ride 22.45 miles to finish the trail.**

Guided Practice

In all, Kobe ran 15.5 miles on Friday, Saturday, and Sunday. He ran 3.75 miles on Friday and 5.6 miles on Saturday. How many miles did Kobe run on Sunday?

Do all the digits have the same number of places to the right of the decimal point? _____

To write the problem, you need to insert a 0 to the right of _____ and _____.

First, _____ to find the total number of miles Kobe ran on Friday and Saturday.

Compute.

Kobe ran _____ miles on Friday and Saturday.

Next, _____ the sum of those two days from the number of miles that Kobe ran in all.

Compute.

What is the result? _____

Kobe ran _____ miles on Sunday.

Lesson Practice • Part 1

Choose the correct answer.

1. Find the difference.

$$\begin{array}{r} 45.37 \\ -\ 27.63 \\ \hline \end{array}$$

A. 22.34

B. 18.74

C. 18.34

D. 17.74

2. Find the difference.

$8.6 - 3.71 = \square$

A. 4.11

B. 4.35

C. 4.89

D. 5.11

3. Find the difference.

$56.23 - 0.01 = \square$

A. 46.23

B. 55.23

C. 56.13

D. 56.22

4. Find the difference.

$62.16 - 43.7 = \square$

A. 18.09

B. 18.46

C. 18.66

D. 19.09

5. Tyler walked 10.4 kilometers and ran 4.6 kilometers yesterday. How much farther did he walk than run?

A. 5.8 kilometers

B. 5.9 kilometers

C. 6.8 kilometers

D. 15 kilometers

6. The distance from Chloe's home to Sandy's home is 92.6 miles. After one hour, Chloe has driven 57.8 miles. How many more miles does Chloe need to drive to reach Sandy's home?

A. 34.8 miles

B. 44.8 miles

C. 45.2 miles

D. 150.4 miles

7. The Olympic record for men's discus throw is 69.89 meters. The women's record is 72.3 meters. How much greater is the women's record than the men's record?

   A. 3.59 meters

   B. 2.59 meters

   C. 2.41 meters

   D. 2.14 meters

8. Melissa worked 37.25 hours this week. She worked 29.5 hours last week. How many more hours did Melissa work this week than last week?

   A. 8.75 hours

   B. 8.65 hours

   C. 8.25 hours

   D. 7.75 hours

9. Nick bought a sweater for $16.75 and a pair of pants for $28.92.

   A. Estimate how much Nick spent on the sweater and pants. Show your work.

   B. If Nick paid with a $50 bill, about how much money will he receive in change? Show your work.

   C. Find the actual amount that Nick will receive in change. Show your work.

Lesson Practice • Part 2

Choose the correct answer.

1. Which number is 0.01 less than 67.354?

   A. 66.354

   B. 67.254

   C. 67.344

   D. 67.353

2. At Ho's Wok, the sesame chicken costs $12.45 on the regular menu. The cost for a smaller portion on the combination platter is $8.79. How much less money is the sesame chicken on the combination platter?

   A. $3.66

   B. $3.76

   C. $4.66

   D. $4.76

3. Which number makes both sentences true?

   $75.3 - \square = 36.84$

   $36.84 + \square = 75.3$

   A. 38.44

   B. 38.46

   C. 38.54

   D. 39.56

4. Ryan bought two CDs for $13.79 each. He paid with two $20 bills. How much change did Ryan receive?

   A. $6.21

   B. $7.31

   C. $12.42

   D. $14.62

5. It takes Uranus 84.01 years to revolve around the Sun. It takes Saturn 29.46 years to revolve around the Sun. How many years fewer does it take Saturn than Uranus to revolve around the Sun?

   A. 55.65 years

   B. 55.55 years

   C. 54.65 years

   D. 54.55 years

6. It is Luna's goal to jog 27.5 kilometers this week. She jogged 5.75 kilometers on Sunday and 3.5 kilometers on Monday. How many more kilometers does she need to jog to reach her goal this week?

   A. 9.25 kilometers

   B. 18.25 kilometers

   C. 21.75 kilometers

   D. 36.75 kilometers

7. Find the difference.

$$\begin{array}{r} 7{,}097.42 \\ -\ \ 634.8 \\ \hline \end{array}$$

A. 6,362.52 **C.** 6,462.58

B. 6,453.62 **D.** 6,462.62

8. The playlist that Brandon made lasted 76.04 minutes. That was 12.57 minutes longer than his prior playlist. What was the length of Brandon's prior playlist?

A. 63.47 minutes

B. 63.83 minutes

C. 88.61 minutes

D. 88.97 minutes

9. Find the difference.

$825.545 - 0.001 = \square$

A. 824.545

B. 825.445

C. 825.535

D. 825.544

10. Diego spent \$5.25 at an arcade and \$4.69 buying lunch. If he had \$20, how much money does he have left?

A. \$9.84 **C.** \$10.06

B. \$9.94 **D.** \$10.16

11. The special breakfast menu at Dan's Diner is shown.

Breakfast Menu

Item	Cost
Egg Sandwich	\$2.79
French Toast	\$5.62
Oatmeal	\$4.25
Pancakes	\$3.89

A. How much more money does the French toast cost than the pancakes? Show your work.

B. If a pair of people bought one order of pancakes and one egg sandwich and paid with a \$10 bill, how much change would they receive? Show your work.

C. If a family bought one of each item and paid with a \$20 bill, how much change would they receive? Show your work.

Lesson 6 Answers

Lesson 6

Guided Practice

Do all the digits have the same number of places to the right of the decimal point? **no**

To write the problem, you need to insert a 0 to the right of **5.6** and **15.5**.

First, **add** to find the total number of miles Kobe ran on Friday and Saturday.

$$\begin{array}{r} {\scriptstyle 1} \\ 3.75 \\ +\ 5.60 \\ \hline 9.35 \end{array}$$

Kobe ran **9.35** miles on Friday and Saturday.

Next, **subtract** the sum of those two days from the number of miles that Kobe ran in all.

$$\begin{array}{r} {\scriptstyle 0\,15\,4\,10} \\ \not{1}\,\not{5}.\not{5}\not{0} \\ -\ \ 9.3\,5 \\ \hline 6.1\,5 \end{array}$$

What is the result? **6.15**

Kobe ran **6.15** miles on Sunday.

Lesson Practice Part 1

1. D
2. C
3. D
4. B
5. A
6. A
7. C
8. D
9. A. $46; Possible work: $16.75 rounds to $17 and $28.92 rounds to $29. $17 + $29 = $46

   B. $4; Possible work: $50 − $46 = $4

   C. $4.33; Possible work: $16.75 + $28.92 = $45.67; $50 − $45.67 = $4.33

Lesson Practice Part 2

1. C
2. A
3. B
4. C
5. D
6. B
7. D
8. A
9. D
10. C
11. A. $1.73; Possible work: $5.62−$3.89 = $1.73

    B. $3.32; Possible work: $3.89 + $2.79 = $6.68, $10.00−$6.68 = $3.32

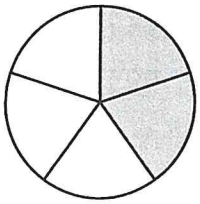
    C. $3.45; Possible work: $5.62 + $4.25 + $6.68 = $16.55, $20.00−$16.55 = $3.45

APRIL 14TH

Equivalent Fractions

Getting the Idea

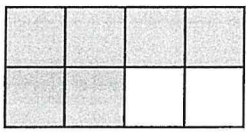
A **fraction** names part of a whole or a group. The number above the fraction bar is called the **numerator**. It shows the number of parts being considered. The number below the fraction bar is called the **denominator**. It shows the total number of equal parts in the whole or in the group. The fraction bar means *divided by*. So if a and b are whole numbers, $\frac{a}{b}$ means $a \div b$.



$\frac{2}{5}$ ← numerator
$\frac{2}{5}$ ← denominator

Example 1

What fraction of the rectangle is shaded?



Strategy **Find the denominator. Then find the numerator.**

Step 1 Count the number of equal parts in the rectangle.

There are 8 parts. This is the denominator.

Step 2 Count the number of parts that are shaded.

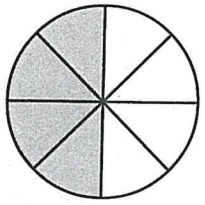
There are 6 parts shaded. This is the numerator.

Step 3 Write the fraction.

$$\frac{\text{numerator}}{\text{denominator}} = \frac{6}{8}$$

Solution **$\frac{6}{8}$ of the rectangle is shaded.**

Two fractions are **equivalent fractions** if they represent the same part of a whole. For example, the model below shows that $\frac{1}{2}$ is equivalent to $\frac{4}{8}$.



$\frac{1}{2} = \frac{4}{8}$

The fraction $\frac{1}{2}$ is in **simplest form** because the numerator and denominator do not have any common factors except 1. To simplify a fraction, divide the numerator and denominator by the **greatest common factor (GCF)**.

Example 2

What is $\frac{6}{8}$ in simplest form?

Strategy **Write an equivalent fraction in simplest form.**

Step 1 Identify the common factors of 6 and 8.

The factors of 6 are 1, 2, 3, and 6.

The factors of 8 are 1, 2, 4, and 8.

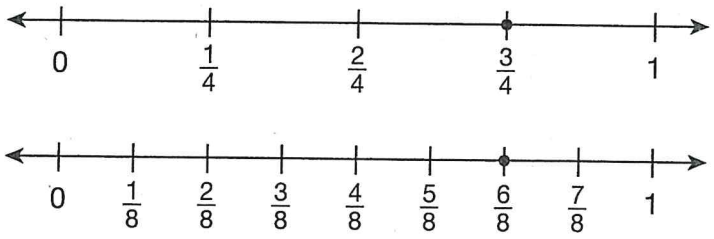
2 is the GCF.

Step 2 Divide the numerator and denominator by 2.

$$\frac{6}{8} = \frac{6 \div 2}{8 \div 2} = \frac{3}{4}$$

Solution **$\frac{6}{8}$ written in simplest form is $\frac{3}{4}$.**

You can use number lines to find equivalent fractions. On the number lines below, the fractions $\frac{3}{4}$ and $\frac{6}{8}$ are equivalent fractions, since both $\frac{3}{4}$ and $\frac{6}{8}$ are the same distance from 0.



You can also find equivalent fractions by multiplying the numerator and denominator by the same number. Multiplying the numerator and denominator by the same number is the same as multiplying by 1, so the value of the fraction is unchanged.

Example 3

Write two equivalent fractions for $\frac{2}{3}$.

Strategy **Multiply the numerator and denominator by the same number.**

Step 1 Multiply the numerator and denominator by 2.

$$\frac{2}{3} = \frac{2 \times 2}{3 \times 2} = \frac{4}{6}$$

Step 2 Multiply the numerator and denominator by 3.

$$\frac{2}{3} = \frac{2 \times 3}{3 \times 3} = \frac{6}{9}$$

Solution **Two equivalent fractions for $\frac{2}{3}$ are $\frac{4}{6}$ and $\frac{6}{9}$.**

An important use for equivalent fractions is to create pairs of fractions with the same denominator. One way to find fractions with the same denominator is to multiply the denominators of the fractions.

Example 4

Write equivalent fractions for $\frac{5}{6}$ and $\frac{1}{4}$ that have the same denominator.

Strategy **Multiply the two denominators to write equivalent fractions.**

Step 1 Multiply the denominators.

$$6 \times 4 = 24$$

Step 2 Write an equivalent fraction for $\frac{5}{6}$ that has a denominator of 24.

$6 \times 4 = 24$, so multiply the numerator and denominator by 4.

$$\frac{5}{6} = \frac{5 \times 4}{6 \times 4} = \frac{20}{24}$$

Step 3 Write an equivalent fraction for $\frac{1}{4}$ that has a denominator of 24.

$4 \times 6 = 24$, so multiply the numerator and denominator by 6.

$$\frac{1}{4} = \frac{1 \times 6}{4 \times 6} = \frac{6}{24}$$

Solution **$\frac{5}{6} = \frac{20}{24}$ and $\frac{1}{4} = \frac{6}{24}$**

One way to determine if two fractions are equivalent is to rename one or both fractions using a common denominator. It is not necessary to use the least common multiple to find the least common denominator. You can multiply the denominators to find a common denominator.

Example 5

Determine if $\frac{2}{6}$ and $\frac{3}{9}$ are equivalent.

Strategy **Rename each fraction using a common denominator.**

Step 1 Multiply the denominators.

$6 \times 9 = 54$

Rename the fractions using 54 as the denominator.

Step 2 Write equivalent fractions.

$\frac{2}{6} \times \frac{9}{9} = \frac{18}{54}$

$\frac{3}{9} \times \frac{6}{6} = \frac{18}{54}$

Solution **The fractions $\frac{2}{6}$ and $\frac{3}{9}$ are equivalent.**

Another method to determine if two fractions are equivalent is to write each in simplest form.

Example 6

Determine if $\frac{8}{10}$ and $\frac{12}{15}$ are equivalent.

Strategy **Write each fraction in simplest form.**

Step 1 Write $\frac{8}{10}$ in simplest form.

$\frac{8}{10} \div \frac{2}{2} = \frac{4}{5}$

Step 2 Write $\frac{12}{15}$ in simplest form.

$\frac{12}{15} \div \frac{3}{3} = \frac{4}{5}$

Solution **The fractions $\frac{8}{10}$ and $\frac{12}{15}$ are equivalent.**

Guided Practice

Write $\frac{8}{10}$ in simplest form. Then write another equivalent fraction for $\frac{8}{10}$.

First, write the fraction in simplest form.

The factors of 8 are _____, _____, _____, _____.

The factors of 10 are _____, _____, _____, _____.

The greatest common factor of 8 and 10 is _____.

Divide the numerator and denominator by _____.

$\frac{8}{10} =$ _____

Next, find another equivalent fraction.

Multiply the numerator and denominator of $\frac{8}{10}$ by _____.

Show your work.

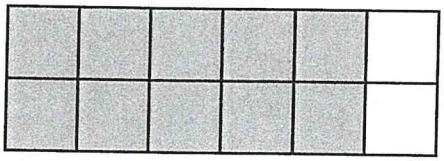
In simplest form, $\frac{8}{10}$ is _____.

Another fraction equivalent to $\frac{8}{10}$ is _____.

Lesson Practice • Part 1

Choose the correct answer.

1. In simplest form, what fraction of the figure is shaded?



   A. $\frac{2}{3}$

   B. $\frac{3}{4}$

   C. $\frac{5}{6}$

   D. $\frac{7}{8}$

2. Which fraction is equivalent to $\frac{3}{9}$?

   A. $\frac{1}{4}$

   B. $\frac{1}{3}$

   C. $\frac{2}{5}$

   D. $\frac{1}{2}$

3. Which fraction is **not** equivalent to $\frac{5}{6}$?

   A. $\frac{25}{30}$

   B. $\frac{20}{24}$

   C. $\frac{15}{18}$

   D. $\frac{30}{42}$

4. Which can you use as a denominator to write equivalent fractions for $\frac{4}{7}$ and $\frac{5}{6}$?

   A. 24

   B. 30

   C. 35

   D. 42

5. Which pair of fractions is equivalent to $\frac{5}{6}$ and $\frac{3}{5}$?

   A. $\frac{25}{30}$ and $\frac{18}{30}$

   B. $\frac{30}{35}$ and $\frac{21}{35}$

   C. $\frac{10}{12}$ and $\frac{6}{12}$

   D. $\frac{15}{20}$ and $\frac{12}{20}$

6. Which fraction is in simplest form?

   A. $\frac{9}{21}$

   B. $\frac{6}{14}$

   C. $\frac{8}{18}$

   D. $\frac{5}{12}$

7. Which number sentence is **not** true?

   A. $\frac{15}{20} = \frac{3}{4}$

   B. $\frac{4}{12} = \frac{1}{3}$

   C. $\frac{2}{5} = \frac{6}{10}$

   D. $\frac{10}{15} = \frac{2}{3}$

8. Which fractions are **not** equivalent to each other?

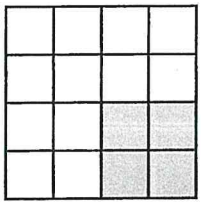
   A. $\frac{1}{4}$ and $\frac{5}{20}$

   B. $\frac{3}{8}$ and $\frac{8}{24}$

   C. $\frac{2}{5}$ and $\frac{14}{35}$

   D. $\frac{9}{10}$ and $\frac{36}{40}$

9. Look at the figure below.



   A. In simplest form, what fraction of the figure is shaded? Show your work.

   B. Find two more fractions that are equivalent to the fraction you found in part A. Show your work.

Lesson Practice • Part 2

Choose the correct answer.

1. Which number completes the sentence?

$$\frac{6}{16} = \frac{9}{\square}$$

A. 19
C. 27
B. 24
D. 32

2. Which fraction is equivalent to $\frac{3}{5}$?

A. $\frac{12}{20}$
B. $\frac{16}{25}$
C. $\frac{20}{30}$
D. $\frac{26}{40}$

3. Which pair of fractions is equivalent?

A. $\frac{9}{12}$ and $\frac{14}{20}$
B. $\frac{6}{16}$ and $\frac{10}{25}$
C. $\frac{12}{15}$ and $\frac{25}{35}$
D. $\frac{10}{18}$ and $\frac{25}{45}$

4. Which fraction is in simplest form?

A. $\frac{11}{15}$
C. $\frac{9}{21}$
B. $\frac{12}{18}$
D. $\frac{14}{24}$

5. A fraction is greater than 0 and less than 1. How can you tell if such a fraction is in simplest form by knowing prime numbers?

A. If the numerator is a prime number, the fraction is in simplest form.
B. If the denominator is a prime number, the fraction is in simplest form.
C. If the numerator is a prime number, the fraction can always be simplified further.
D. If the denominator is a prime number, the fraction can always be simplified further.

6. Which pair of fractions has a common denominator that is less than the product of the two denominators?

A. $\frac{2}{3}$ and $\frac{3}{8}$
B. $\frac{5}{6}$ and $\frac{7}{11}$
C. $\frac{7}{9}$ and $\frac{11}{12}$
D. $\frac{7}{10}$ and $\frac{5}{7}$

7. Which pair of fractions is equivalent to $\frac{5}{8}$ and $\frac{7}{12}$?

   A. $\frac{20}{36}$ and $\frac{28}{36}$

   B. $\frac{25}{40}$ and $\frac{24}{36}$

   C. $\frac{25}{60}$ and $\frac{35}{60}$

   D. $\frac{60}{96}$ and $\frac{56}{96}$

8. Which number completes the sentence?

   $$\frac{12}{18} = \frac{\square}{30}$$

   A. 15

   B. 18

   C. 20

   D. 24

9. Which fraction is equivalent to $\frac{15}{24}$?

   A. $\frac{2}{3}$

   B. $\frac{3}{4}$

   C. $\frac{5}{8}$

   D. $\frac{7}{12}$

10. Which fraction is equivalent to $\frac{5}{12}$?

    A. $\frac{15}{36}$

    B. $\frac{18}{48}$

    C. $\frac{24}{60}$

    D. $\frac{35}{72}$

11. Each day Gianna practices penalty kicks with her older brother as the goalie. Yesterday she made $\frac{18}{24}$ of her penalty kicks. Today she plans on shooting 36 penalty kicks.

    A. How many penalty kicks would Gianna have to make to successfully shoot an equivalent fraction as yesterday? Show your work.

    B. In simplest form, what fraction of her penalty kicks did Gianna make yesterday? Show your work.

Lesson 7 Answers

Lesson 7

Guided Practice

The factors of 8 are **1, 2, 4, 8.**

The factors of 10 are **1, 2, 5, 10.**

The greatest common factor of 8 and 10 is **2.**

Divide the numerator and denominator by **2.**

$\frac{8}{10} = \frac{8 \div 2}{10 \div 2} = \frac{4}{5}$

Multiply the numerator and denominator of $\frac{8}{10}$ by **Possible answer: 2.**

Possible work:

$\frac{8}{10} = \frac{8 \times 2}{10 \times 2} = \frac{16}{20}$

In simplest form, $\frac{8}{10}$ is $\frac{4}{5}$.

Another fraction equivalent to $\frac{8}{10}$ is **Possible answer: $\frac{16}{20}$.**

Lesson Practice Part 1

1. C
2. B
3. D
4. D
5. A
6. D
7. C
8. B
9. A. $\frac{1}{4}$, $\frac{4}{16} = \frac{4 \div 4}{16 \div 4} = \frac{1}{4}$

   B. Possible answer:

   $\frac{1}{4} = \frac{1 \times 2}{4 \times 2} = \frac{2}{8}$,

   $\frac{1}{4} = \frac{1 \times 3}{4 \times 3} = \frac{3}{12}$

Lesson Practice Part 2

1. B
2. A
3. D
4. A
5. B
6. C
7. D
8. C
9. C
10. A
11. A. 27; Possible work: $\frac{18}{24} \div \frac{2}{2}$

    $= \frac{9}{12}$, $\frac{9}{12} \times \frac{3}{3} = \frac{27}{36}$

    B. $\frac{3}{4}$; Possible work:

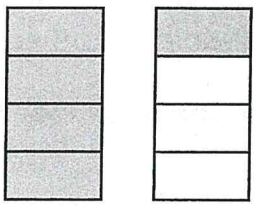
    $\frac{18}{24} \div \frac{6}{6} = \frac{3}{4}$

APRIL 15TH

mproper Fractions and Mixed Numbers

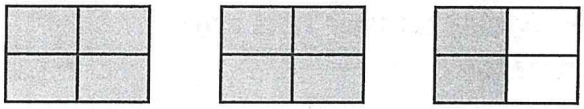
Getting the Idea

A **mixed number** can be written as an **improper fraction**. In an improper fraction, the numerator is greater than the denominator. For example, the mixed number $1\frac{1}{4}$ can be written as an improper fraction. The model below shows that $1\frac{1}{4} = \frac{5}{4}$. Each rectangle is divided into 4 equal parts, which is the denominator. There are 5 parts shaded, so that is the numerator.



Example 1

In simplest form, what mixed number is modeled below?



Strategy **Find the whole-number part. Then find the fraction part.**

Step 1 Count the number of completely shaded figures.

There are 2 rectangles completely shaded.

The whole-number part is 2.

Step 2 Find the fraction of the figure that is partially shaded.

$\frac{2}{4}$ of the figure is shaded.

Step 3 Write the fraction part in simplest form.

The greatest common factor of 2 and 4 is 2.

$\frac{2}{4} = \frac{2 \div 2}{4 \div 2} = \frac{1}{2}$

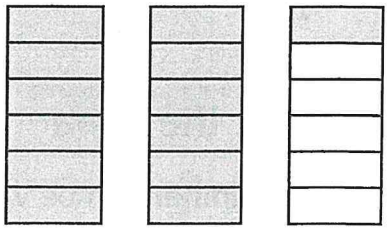
Step 4 Add the whole-number part and the fraction part.

$2 + \frac{1}{2} = 2\frac{1}{2}$

Solution **The mixed number shown by the model is $2\frac{1}{2}$.**

Example 2

What improper fraction does the model represent?



Strategy **Identify the numerator and the denominator.**

Step 1 To find the numerator, count the number of shaded parts.

There are 13 shaded parts.

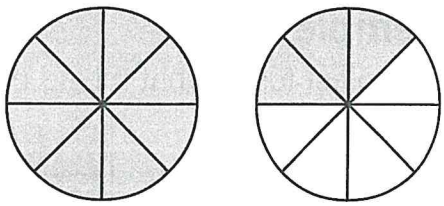
Step 2 To find the denominator, count the number of equal parts in each rectangle.

Each rectangle is divided into 6 equal parts.

Solution **The model represents the improper fraction $\frac{13}{6}$.**

Example 3

What mixed number and improper fraction does this model represent?



Strategy **Identify the whole-number part and the fraction part.**

Step 1 Identify the whole-number part of the mixed number.

One circle is completely shaded. The whole-number part is 1.

Step 2 Identify the fraction part of the mixed number.

In the second circle, 3 parts are shaded out of 8 equal parts. The fraction part is $\frac{3}{8}$. The mixed number is $1\frac{3}{8}$.

Step 3 Identify the numerator of the improper fraction.

There are 11 shaded parts. The numerator is 11.

Step 4 Identify the denominator of the improper fraction.

Each circle is divided into 8 equal parts. The denominator is 8.

The improper fraction is $\frac{11}{8}$.

Solution **The model represents the mixed number $1\frac{3}{8}$ and the improper fraction $\frac{11}{8}$.**

You can convert a mixed number to an improper fraction. A mixed number represents the sum of a whole number and a fraction less than 1. Writing the whole-number part as an equivalent fraction can help you to write a mixed number as an improper fraction.

For example, convert $2\frac{1}{6}$ to an improper fraction.

Write the whole number as a fraction with a denominator of 1.

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

Write an equivalent fraction for it with the same denominator as the fraction part of the mixed number.

$$\frac{2}{1} + \frac{1}{6} = \frac{12}{6} + \frac{1}{6}$$

Add the two fractions to represent the mixed number as an improper fraction.

$$\frac{12}{6} + \frac{1}{6} = \frac{13}{6}$$

So, $2\frac{1}{6}$ written as an improper fraction is $\frac{13}{6}$.

Example 4

Convert $3\frac{1}{2}$ to an improper fraction.

Strategy **Write the whole-number part as an equivalent fraction.**

Step 1 Write the whole number as a fraction with a denominator of 1.

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

Step 2 Write $\frac{3}{1}$ as an equivalent fraction with a denominator of 2.

Multiply the numerator and the denominator by 2.

$$\frac{3}{1} = \frac{3 \times 2}{1 \times 2} = \frac{6}{2}$$

Step 3 Add the equivalent fraction and the fraction part of the mixed number.

$$\frac{6}{2} + \frac{1}{2} = \frac{7}{2}$$

Solution $3\frac{1}{2} = \frac{7}{2}$

You could also follow these steps to convert a mixed number to an improper fraction.

1. Multiply the whole number by the denominator of the fraction part.
2. Add the numerator of the fraction part to the product. This sum is the numerator of the improper fraction.
3. The denominator of the improper fraction is the same as the denominator of the fraction part in the mixed number.

Example 5

Write $4\frac{7}{10}$ as an improper fraction.

Strategy **Multiply the whole-number part by the denominator. Then add the numerator to the product.**

Step 1 Multiply the whole number by the denominator.

$4 \times 10 = 40$

Step 2 Add the numerator of the fraction part to the product.

$40 + 7 = 47$

Step 3 Write the improper fraction.

The numerator is 47.

The denominator remains 10.

Solution $4\frac{7}{10} = \frac{47}{10}$

To convert an improper fraction to a mixed number, divide the numerator by the denominator. The quotient (without the remainder) is the whole-number part of the mixed number. The remainder is the numerator of the fraction part. The denominator remains the same if the mixed number is in simplest form.

Example 6

Write $\frac{16}{6}$ as a mixed number in simplest form.

Strategy **Divide the numerator by the denominator.**

Step 1 Divide the numerator by the denominator.

$\frac{16}{6} = 16 \div 6 = 2\ \text{R4}$

Step 2 Write the mixed number.

The quotient, 2, is the whole-number part.

The remainder, 4, is the numerator of the fraction part.

The denominator, 6, stays the same.

The mixed number is $2\frac{4}{6}$.

Step 3 Write the fraction in simplest form.

The greatest common factor of 4 and 6 is 2.

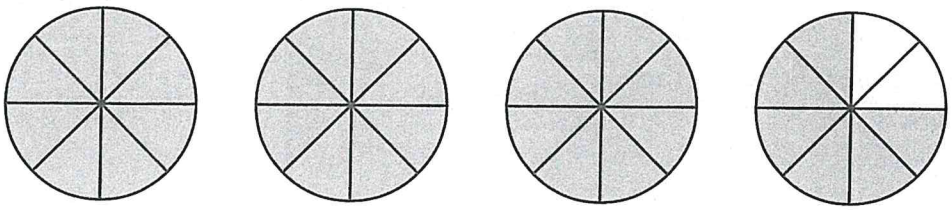
$\frac{4}{6} = \frac{4 \div 2}{6 \div 2} = \frac{2}{3}$

Solution **$\frac{16}{6}$ written as a mixed number in simplest form is $2\frac{2}{3}$.**

Note: You can also use the fact that $\frac{6}{6} = 1$ to convert the improper fraction in Example 6 to a mixed number. $\frac{16}{6} = \frac{6}{6} + \frac{6}{6} + \frac{4}{6} = 1 + 1 + \frac{4}{6} = 2\frac{2}{3}$

Guided Practice

Ms. Rossi's class had a pizza party. The shaded parts of the diagram show the amount of pizza that the class ate.



What mixed number in simplest form represents the amount of pizza the class ate?

How many pizzas are completely shaded? _____

Each pizza is divided into _____ equal parts.

How many parts are shaded in the partially shaded circle? _____

What fraction of the last circle is shaded? _____

Write the fraction in simplest form. _____

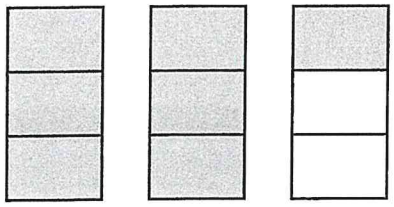
Add the whole-number part and the fraction part. _____ + _____ = _____

A total of _____ pizzas were eaten.

Lesson Practice • Part 1

Choose the correct answer.

Use the model for questions 1 and 2.



1. What improper fraction does the model show?

   A. $\frac{5}{3}$

   B. $\frac{3}{2}$

   C. $\frac{7}{3}$

   D. $\frac{7}{2}$

2. What mixed number does the model show?

   A. $2\frac{1}{3}$

   B. $2\frac{2}{3}$

   C. $3\frac{1}{3}$

   D. $3\frac{2}{3}$

3. Which shows $4\frac{2}{5}$ written as an improper fraction?

   A. $\frac{10}{4}$

   B. $\frac{14}{5}$

   C. $\frac{22}{5}$

   D. $\frac{42}{5}$

4. Which is $\frac{26}{4}$ written as a mixed number in simplest form?

   A. $6\frac{1}{4}$

   B. $6\frac{1}{2}$

   C. $6\frac{2}{4}$

   D. $6\frac{3}{4}$

5. Which shows $\frac{21}{12}$ written as a mixed number in simplest form?

   A. $1\frac{1}{2}$

   B. $1\frac{7}{12}$

   C. $1\frac{2}{3}$

   D. $1\frac{3}{4}$

6. What improper fraction is equivalent to $4\frac{7}{8}$?

   A. $\frac{31}{8}$

   B. $\frac{39}{8}$

   C. $\frac{41}{8}$

   D. $\frac{47}{8}$

7. Which mixed number and improper fraction are **not** equivalent?

   A. $\frac{9}{2}$ and $4\frac{1}{2}$

   B. $\frac{14}{4}$ and $3\frac{1}{2}$

   C. $\frac{16}{6}$ and $2\frac{2}{3}$

   D. $\frac{28}{8}$ and $3\frac{1}{4}$

8. Which is another way to write $2\frac{3}{5}$?

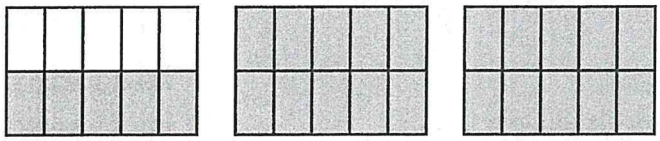
   A. $\frac{11}{5}$

   B. $\frac{13}{5}$

   C. $\frac{18}{5}$

   D. $\frac{33}{5}$

9. Rajeev put pieces of a puzzle together and made this figure.



   A. What mixed number in simplest form represents the shaded part of the figure?

   B. What improper fraction represents the shaded part of the figure? Explain how you found your answer.

Lesson Practice • Part 2

Choose the correct answer.

1. Which improper fraction is equivalent to a whole number?

   A. $\frac{15}{4}$ **C.** $\frac{18}{6}$

   B. $\frac{17}{5}$ **D.** $\frac{22}{8}$

2. Which describes how to rename a mixed number as the numerator of an improper fraction?

   A. Multiply the whole number times the numerator. Then add the product to the numerator of the fraction, which is the numerator of the improper fraction.

   B. Multiply the whole number times the denominator. Then add the product to the denominator of the fraction, which is the denominator of the improper fraction.

   C. Multiply the whole number times the numerator. Then add the product to the denominator of the fraction, which is the denominator of the improper fraction.

   D. Multiply the whole number times the denominator. Then add the product to the numerator of the fraction, which is the numerator of the improper fraction.

3. Which shows $\frac{36}{16}$ as a mixed number in simplest form?

   A. $2\frac{1}{8}$ **C.** $2\frac{1}{2}$

   B. $2\frac{1}{4}$ **D.** $2\frac{3}{4}$

4. Which describes how to rename an improper fraction to a mixed number?

   A. Divide the numerator by the denominator. The quotient is the whole-number part and the remainder is the numerator of the fraction part of the mixed number. The denominator stays the same.

   B. Divide the denominator by the numerator. The quotient is the whole-number part and the remainder is the numerator of the fraction part of the mixed number. The denominator stays the same.

   C. Divide the numerator by the denominator. The quotient is the numerator of the fraction and the remainder is the whole-number part of the mixed number. The denominator stays the same.

   D. Divide the denominator by the numerator. The quotient is the numerator of the fraction and the remainder is the whole-number part of the mixed number. The denominator stays the same.

5. Which improper fraction is equivalent to $5\frac{5}{6}$?

A. $\frac{25}{6}$ C. $\frac{35}{6}$

B. $\frac{31}{6}$ D. $\frac{55}{6}$

6. Which number completes the sentence?

$$4\frac{5}{12} = \frac{\square}{12}$$

A. 45 C. 55

B. 53 D. 64

7. Which improper fraction completes the sentence?

$$\frac{37}{5} = \_\_\_\_$$

A. $7\frac{2}{5}$ C. $8\frac{2}{5}$

B. $7\frac{3}{5}$ D. $8\frac{3}{5}$

8. Which has a different value than the others?

A. $\frac{14}{4}$ C. $3\frac{2}{4}$

B. $3\frac{1}{2}$ D. $\frac{40}{12}$

9. Julian jogged $2\frac{3}{4}$ miles yesterday.

A. What improper fraction is equivalent to $2\frac{3}{4}$?

B. Write two more equivalent improper fractions for $2\frac{3}{4}$. Show your work.

Lesson 8 Answers

Lesson 8

Guided Practice

How many pizzas are completely shaded? **3**

Each pizza is divided into **8** equal parts.

How many parts are shaded in the partially shaded circle? **6**

What fraction of the last circle is shaded? $\frac{6}{8}$

Write the fraction in simplest form. $\frac{3}{4}$

Add the whole-number part and the fraction part. $3 + \frac{3}{4} = 3\frac{3}{4}$

A total of $3\frac{3}{4}$ pizzas were eaten.

Lesson Practice Part 1

1. C
2. A
3. C
4. B
5. D
6. B
7. D
8. B
9. A. $2\frac{1}{2}$

   B. $\frac{5}{2}$; Possible explanation: Each rectangle is divided into 10 equal parts. So $\frac{25}{10}$ parts are shaded. $\frac{25}{10}$ can be simplified to $\frac{5}{2}$ by dividing both the numerator and denominator by 5.

Lesson Practice Part 2

1. C
2. D
3. B
4. A
5. C
6. B
7. A
8. D
9. A. $\frac{11}{4}$

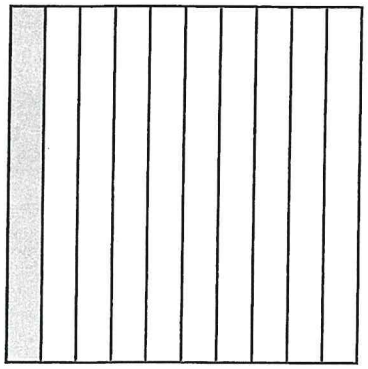
   B. Possible answers: $\frac{22}{8}$, $\frac{33}{12}$; Possible work based on possible answers: $\frac{11}{4} \times \frac{2}{2} = \frac{22}{8}$, $\frac{11}{4} \times \frac{3}{3} = \frac{33}{12}$

APRIL 16TH

Compare and Order Fractions and Decimals

Getting the Idea

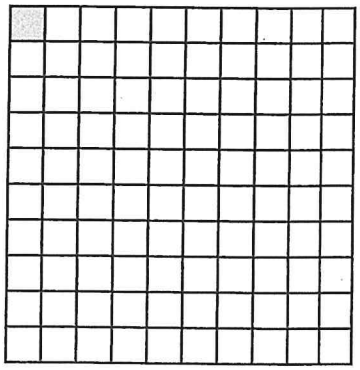
You can write a fraction with a denominator of 10 or 100 as a decimal.



1 shaded part, 10 equal parts

Fraction: $\frac{1}{10}$

Decimal: 0.1



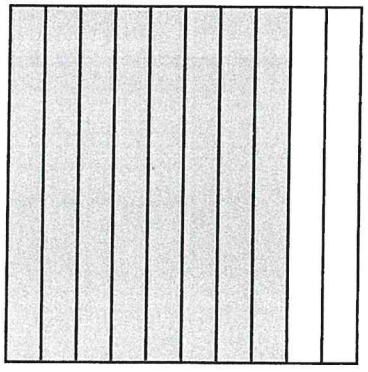
1 shaded part, 100 equal parts

Fraction: $\frac{1}{100}$

Decimal: 0.01

Example 1

What fraction and decimal name the shaded part of the grid?



Strategy **Look at the parts of the grid.**

Step 1 Write the fraction that represents the shaded part of the grid.

8 parts are shaded. There are 10 equal parts in all.

$\frac{8}{10}$

Step 2 Simplify the fraction.

$$\frac{8}{10} = \frac{2}{5}$$

Step 3 Write the decimal that represents the shaded part of the grid.

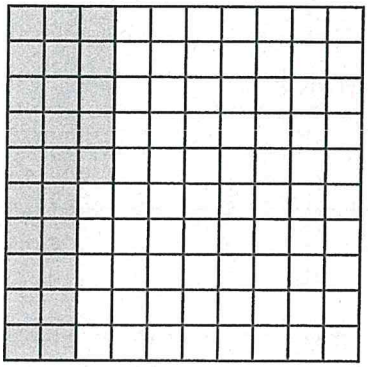
There are 8 tenths shaded out of 10 tenths.

0.8

Solution **The fractions $\frac{8}{10}$ or $\frac{2}{5}$, and the decimal 0.8 name the shaded part of the grid.**

Example 2

What fraction and decimal name the shaded part of the grid?



Strategy **Look at the parts of the grid.**

Step 1 Write the fraction that represents the shaded part of the grid.

25 parts are shaded. There are 100 equal parts in all.

$$\frac{25}{100}$$

Step 2 Simplify the fraction.

$$\frac{25}{100} = \frac{1}{4}$$

Step 3 Write the decimal that represents the shaded part of the grid.

There are 25 hundredths shaded out of 100 hundredths.

0.25

Solution **The fractions $\frac{25}{100}$ and $\frac{1}{4}$, and the decimal 0.25 name the shaded part of the grid.**

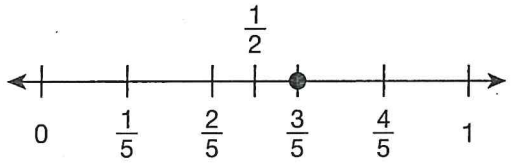
You can use a number line and benchmark fractions to compare fractions.

Example 3

Which is greater $\frac{3}{5}$ or $\frac{4}{10}$?

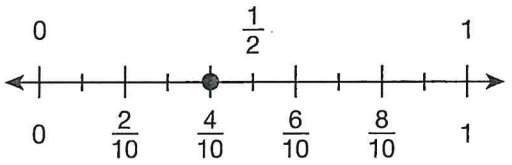
Strategy **Use a number line to compare the fractions.**

Step 1 Plot $\frac{3}{5}$ on a number line.



$\frac{3}{5}$ is greater than the benchmark fraction $\frac{1}{2}$.

Step 2 Plot $\frac{4}{10}$ on a number line.



$\frac{4}{10}$ is less than the benchmark fraction $\frac{1}{2}$.

Solution **$\frac{3}{5}$ is greater than $\frac{4}{10}$.**

You can compare **unit fractions.** A unit fraction always has a numerator of 1. When comparing unit fractions, the fraction with the least denominator is greater.

Example 4

Which is greater $\frac{1}{3}$ or $\frac{1}{8}$?

Strategy **Compare the fractions.**

Step 1 Do both fractions have the same numerator?

Yes, the fractions have a numerator of 1.

So they are unit fractions.

Step 2 Compare the denominators.

The fraction with the least denominator is greater.

3 is less than 8.

So, $\frac{1}{3}$ is greater than $\frac{1}{8}$.

Solution **$\frac{1}{3}$ is greater than $\frac{1}{8}$.**

The symbols used to compare whole numbers can also be used to compare decimals, fractions, and mixed numbers. To compare fractions, they must have the same denominator, or a **like denominator**. Make sure the fractions have a like denominator, and then compare the numerators.

The symbol $>$ means **is greater than**.

The symbol $<$ means **is less than**.

The symbol $=$ means **is equal to**.

Example 5

Which is less $\frac{2}{5}$ or $\frac{4}{5}$?

Strategy **Compare the fractions.**

Step 1 Do both fractions have the same denominator?

Yes, the fractions have a like denominator of 5.

Step 2 Compare the numerators.

$2 < 4$

Solution $\frac{2}{5} < \frac{4}{5}$

Example 6

Which number has the least value?

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

Strategy **Compare the whole number parts. Then compare the fractional parts.**

Step 1 Compare the whole number parts.

$2 < 3$, so $2\frac{5}{6}$ and $2\frac{1}{4}$ are less than $3\frac{5}{8}$.

Therefore, $3\frac{5}{8}$ does not have the least value.

Step 2 $2\frac{5}{6}$ and $2\frac{1}{4}$ have the same whole number part, 2, so compare the fractional parts.

The fractional parts have different denominators, so find equivalent fractions for each.

Multiply the denominators. $6 \times 4 = 24$

Rename the fractions using 24 as a denominator.

$\frac{5}{6} \times \frac{4}{4} = \frac{20}{24}$

$\frac{1}{4} \times \frac{6}{6} = \frac{6}{24}$

Step 3 Compare.

$\frac{6}{24} < \frac{20}{24}$, so $2\frac{6}{24} < 2\frac{20}{24}$.

So $2\frac{1}{4} < 2\frac{5}{6} < 3\frac{5}{8}$.

Solution **$2\frac{1}{4}$ has the least value.**

Guided Practice

Order these numbers from least to greatest.

9.5 9.07 9.308 9

Compare the whole number parts.

Each number has a _____ as its whole number part.

Annex zeros so that each number has 3 digits after the decimal point.

9.5 → 9.500

9.07 → _____

9.308 → _____

9 → _____

Use place value to find the least number and the greatest number.

The least number is _____.

The greatest number is _____.

Use place value to compare the remaining numbers.

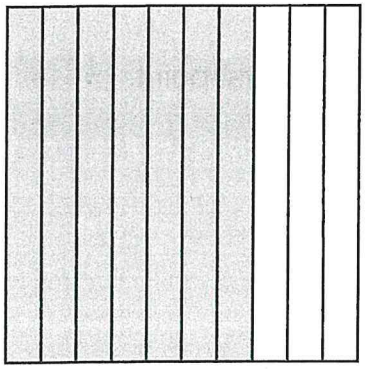
_____ < _____

The order of the numbers from least to greatest is _____, _____, _____, _____.

Lesson Practice • Part 1

Choose the correct answer.

1. Which represents the shaded part of the grid?



A. 0.3 and $\frac{3}{10}$

B. 0.3 and $\frac{7}{10}$

C. 0.7 and $\frac{3}{10}$

D. 0.7 and $\frac{7}{10}$

2. Which is a true statement?

A. $5.8 < 5.48$

B. $5.39 < 5.48$

C. $5.482 < 5.48$

D. $5.49 < 5.48$

3. Which of these mixed numbers has the greatest value?

A. $4\frac{1}{3}$

B. $4\frac{1}{6}$

C. $2\frac{1}{8}$

D. $4\frac{1}{10}$

4. Which of these numbers has a value between 600.01 and 600.1?

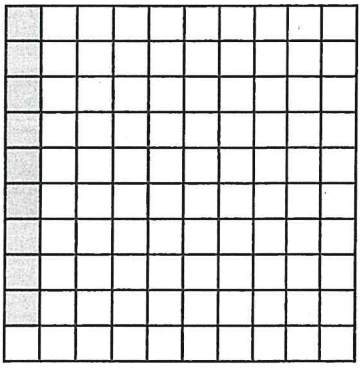
A. 600.002

B. 600.092

C. 60.045

D. 601.003

5. Which represents the shaded part of the grid?



A. 0.09 and $\frac{9}{10}$

B. 0.09 and $\frac{9}{100}$

C. 0.9 and $\frac{9}{10}$

D. 0.9 and $\frac{9}{100}$

6. Kyle's longest jumps were 2.4 meters, 2.6 meters, 2.9 meters, and 2.2 meters. Which shows these jumps in order from least to greatest meters?

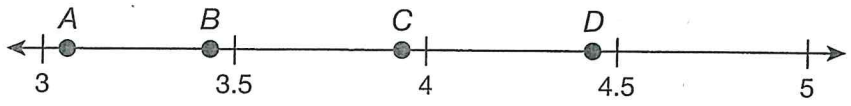
A. 2.2, 2.6, 2.4, 2.9

B. 2.9, 2.6, 2.4, 2.2

C. 2.4, 2.6, 2.2, 2.9

D. 2.2, 2.4, 2.6, 2.9

7. Which point on the number line best represents the location of 3.48? Explain how you found your answer.



8. Emil records the time of each of his mile races. One race took him 12.38 minutes and the other took him 12.35 minutes. Which race took Emil the longest time to run?

9. The table shows the lengths in feet of four pieces of ribbon.

Ribbon Lengths

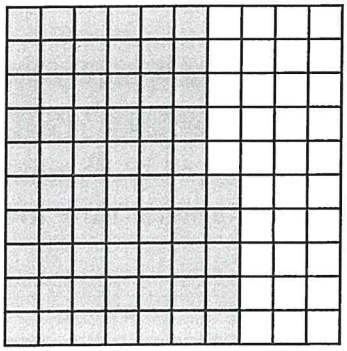
Ribbon Color	Length (in feet)
Blue	$\frac{7}{12}$
Green	$\frac{1}{2}$
Red	$\frac{3}{4}$
Yellow	$\frac{2}{3}$

Order the ribbons from least to greatest length, in feet. Show your work.

Lesson Practice • Part 2

Choose the correct answer.

1. Which represents the shaded part of the grid?



A. 0.35 and $\frac{35}{100}$

B. 0.35 and $\frac{65}{100}$

C. 0.65 and $\frac{35}{100}$

D. 0.65 and $\frac{65}{100}$

2. Which of the following is a true statement?

A. $4.526 > 4.524$

B. $4.427 > 4.524$

C. $4.508 > 4.524$

D. $4.024 > 4.524$

3. Which of these mixed numbers has the least value?

A. $1\frac{2}{3}$

B. $1\frac{5}{6}$

C. $1\frac{1}{4}$

D. $1\frac{1}{6}$

4. Which shows these numbers in order from least to greatest?

17.8, 17.08, 18, 17.801

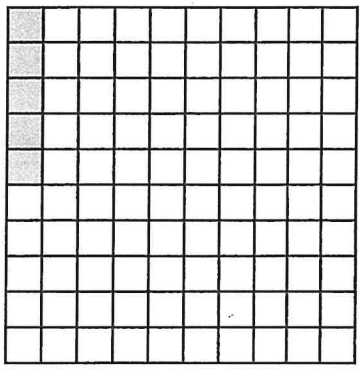
A. 17.8, 18, 17.08, 17.801

B. 18, 17.8, 17.08, 17.801

C. 17.08, 17.8, 17.801, 18

D. 17.801, 18, 17.08, 17.8

5. Which represents the shaded part of the grid?



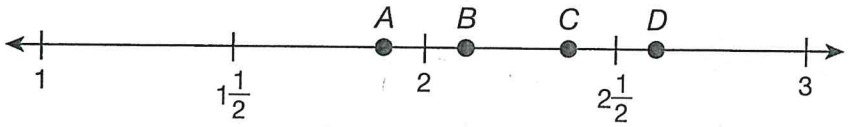
A. 0.5 and $\frac{5}{10}$

B. 0.5 and $\frac{5}{100}$

C. 0.05 and $\frac{5}{10}$

D. 0.05 and $\frac{5}{100}$

6. Which point on the number line best represents the location of $2\frac{3}{8}$? Explain how you found your answer.



7. The table shows the items that Wanda purchases from the bulk section in the store.

Item	Mass (in kilograms)
Banana chips	$2\frac{7}{10}$
Sunflower seeds	$1\frac{3}{5}$
Walnuts	$1\frac{2}{10}$
Dried peaches	$2\frac{4}{5}$

Order the items from least mass to greatest mass.

8. Gary writes these numbers in order from least to greatest.

4.082 4.106 4.09 4.3

Did Gary make any errors? Explain.

Lesson 9 Answers

Lesson 9

Guided Practice

Order these numbers from least to greatest.

9.5 9.07 9.308 9

Compare the whole number parts.

Each number has a **9** as its whole number part.

Annex zeros so that each number has 3 digits after the decimal point.

9.5 → 9.500

9.07 → **9.070**

9.308 → **9.308**

9 → **9.000**

Use place value to find the least number and the greatest number.

The least number is **9.000**.

The greatest number is **9.500**.

Use place value to compare the remaining numbers.

9.070 < 9.308

The order of the numbers from least to greatest is **9, 9.07, 9.308, 9.5.**

Lesson Practice Part 1

1. D
2. B
3. A
4. B
5. B
6. D
7. Point *B*; Possible explanation: I determined that 3.48 is less than 3.5 and greater than 3.25.
8. The race that took 12.38 minutes took Emil the longest time to run.
9. Green $\frac{1}{2}$, Blue $\frac{7}{12}$, Yellow $\frac{2}{3}$, Red $\frac{3}{4}$; Possible work:

   $\frac{1}{2} \times \frac{6}{6} = \frac{6}{12}$,

   $\frac{7}{12}$,

   $\frac{2}{3} \times \frac{4}{4} = \frac{8}{12}$,

   $\frac{3}{4} \times \frac{3}{3} = \frac{9}{12}$,

   $\frac{6}{12} < \frac{7}{12} < \frac{8}{12} < \frac{9}{12}$

Lesson Practice Part 2

1. D
2. A
3. D
4. C
5. D
6. Point C; Possible explanation: I used benchmarks and determined that $2\frac{3}{8}$ is less than $2\frac{1}{2}$, but greater than $2\frac{1}{4}$.
7. Walnuts, Sunflower seeds, Banana chips, Dried peaches
8. Yes. Possible explanation: Gary incorrectly ordered the numbers from least to greatest. He mixed up 4.09 and 4.106. The correct order from least to greatest is 4.082, 4.09, 4.106, 4.3.

APRIL 17TH

Add Fractions

Getting the Idea

To find the sum of fractions that have **like denominators**, add the numerators. The denominator remains the same. Write the sum in simplest form.

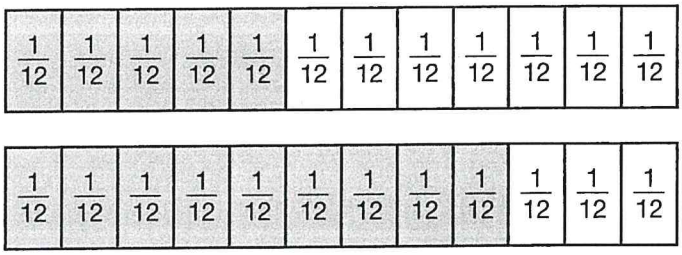
Example 1

Add.

$\frac{5}{12} + \frac{9}{12} = \square$

Strategy **Use fraction strips to find the sum.**

Step 1 Shade fraction strips to show $\frac{5}{12}$ and $\frac{9}{12}$.



Step 2 Count the total number of shaded parts.

Write 14 as the numerator. The denominator stays the same.

$\frac{5}{12} + \frac{9}{12} = \frac{5+9}{12} = \frac{14}{12}$

Step 3 Convert the improper fraction to a mixed number.

$\frac{14}{12} = \frac{12}{12} + \frac{2}{12} = 1\frac{2}{12}$

Step 4 Write the mixed number in simplest form.

$\frac{2}{12} = \frac{2 \div 2}{12 \div 2} = \frac{1}{6}$

So $1\frac{2}{12} = 1\frac{1}{6}$.

Solution $\mathbf{\frac{5}{12} + \frac{9}{12} = 1\frac{1}{6}}$

To add fractions with unlike denominators, you will need to find equivalent fractions for one or both fractions, so that they have a common denominator. One way to find a **common denominator** is to multiply the denominators of the fractions.

Example 2

In a science experiment, a plant grew $\frac{3}{4}$ inch one week and another $\frac{2}{3}$ inch the following week. How many inches did it grow during the two weeks?

Strategy **Write equivalent fractions with a common denominator. Then add.**

Step 1 Find a common denominator.

Multiply the two denominators.

$4 \times 3 = 12$

Step 2 Write equivalent fractions with 12 as the denominator.

$$\frac{3}{4} = \frac{3 \times 3}{4 \times 3} = \frac{9}{12}$$

$$\frac{2}{3} = \frac{2 \times 4}{3 \times 4} = \frac{8}{12}$$

Step 3 Add.

$$\frac{9}{12} + \frac{8}{12} = \frac{17}{12}$$

Step 4 Convert the improper fraction to a mixed number in simplest form.

$$\frac{17}{12} = 1\frac{5}{12}$$

Solution **The plant grew $1\frac{5}{12}$ inches.**

Add mixed numbers in the same way that fractions are added. First add the fraction parts and then add the whole-number parts.

When the denominator of one fraction is a factor of the other fraction, use the greater number as the common denominator.

Example 3

Robert hiked $3\frac{1}{5}$ miles Saturday and $4\frac{3}{10}$ miles Sunday. How many miles did he hike in all?

Strategy **Add the whole numbers and then add the fractions.**

Step 1 Find a common denominator.

Since 10 is a multiple of 5, a common denominator is 10.

Step 2 Find the fraction equivalent to $\frac{1}{5}$ with a denominator of 10.

$$\frac{1 \times 2}{5 \times 2} = \frac{2}{10}$$

$$3\frac{1}{5} = 3\frac{2}{10}$$

Step 3 Add the fractions. Write the sum in simplest form.

$$\frac{2}{10} + \frac{3}{10} = \frac{5}{10}$$

$$\frac{5}{10} \div \frac{5}{5} = \frac{1}{2}$$

Step 4 Add the whole numbers.

$$3 + 4 = 7$$

Step 5 Add the sums.

$$\frac{1}{2} + 7 = 7\frac{1}{2}$$

Solution **Robert hiked $7\frac{1}{2}$ miles in all.**

You can use **benchmarks** to make an estimate. A benchmark is a common number that can be compared to another number.

Use the benchmarks 0, $\frac{1}{2}$, and 1 to make an estimate.

- If the fraction is less than $\frac{1}{4}$, round the fraction to 0.
- If the fraction is greater than or equal to $\frac{1}{4}$ and less than $\frac{3}{4}$, round to $\frac{1}{2}$.
- If the fraction is greater than or equal to $\frac{3}{4}$, round up to 1.

Example 4

Estimate the sum of $\frac{2}{3} + \frac{2}{5}$ to the nearest $\frac{1}{2}$.

Strategy **Round each addend to the nearest $\frac{1}{2}$.**

Step 1 Round $\frac{2}{3}$ to the nearest $\frac{1}{2}$.

Since $\frac{1}{2} < \frac{2}{3} < \frac{3}{4}$, round $\frac{2}{3}$ to $\frac{1}{2}$.

Step 2 Round $\frac{2}{5}$ to the nearest $\frac{1}{2}$.

Since $\frac{1}{4} < \frac{2}{5} < \frac{1}{2}$, round $\frac{2}{5}$ to $\frac{1}{2}$.

Step 3 Add the rounded numbers.

$\frac{1}{2} + \frac{1}{2} = 1$

Solution **The sum of $\frac{2}{3} + \frac{2}{5}$ is about 1.**

Another way to add fractions with unlike denominators is to write equivalent fractions with the **least common denominator (LCD)**. You can find the LCD by listing the multiples of the denominators and finding the least number that is a common multiple.

Example 5

Keira walked $\frac{5}{8}$ mile on Oak Avenue and then $\frac{7}{10}$ mile on Third Street to visit Cora. How far did Keira walk to visit Cora?

Strategy **Write equivalent fractions using the LCD. Then add.**

Step 1 Find the LCD of $\frac{5}{8}$ and $\frac{7}{10}$.

List the multiples of 8: 8, 16, 24, 32, 40

List the multiples of 10: 10, 20, 30, 40

The LCD is 40.

Step 2 Write equivalent fractions with 40 as the denominator.

$\frac{5}{8} \times \frac{5}{5} = \frac{25}{40}$

$\frac{7}{10} \times \frac{4}{4} = \frac{28}{40}$

Step 3 Add the equivalent fractions.

$$\frac{25}{40} + \frac{28}{40} = \frac{53}{40}$$

Step 4 Write the sum as a mixed number.

$$\frac{53}{40} = 1\frac{13}{40}$$

Solution **Keira walked $1\frac{13}{40}$ miles to visit Cora.**

You can add fractions with unlike denominators by multiplying the denominators to write a common denominator. For the numerators, you can multiply each numerator by the denominator of the other fraction and add the products.

Example 6

Add: $\frac{3}{4} + \frac{5}{6}$

Strategy **Use multiplication to add fractions.**

Step 1 Multiply the denominators to find a common denominator.

$4 \times 6 = 24$

Use 24 for the denominator.

Step 2 Multiply the numerator of one fraction by the denominator of the other fraction.

$$\frac{3}{4} + \frac{5}{6} = \frac{3 \times 6}{24} + \frac{5 \times 4}{24}$$

$$\frac{3 \times 6}{24} + \frac{5 \times 4}{24} = \frac{18}{24} + \frac{20}{24}$$

Step 3 Add.

$$\frac{18}{24} + \frac{20}{24} = \frac{38}{24}$$

Step 4 Write the sum as a mixed number in simplest form.

$$\frac{38}{24} = \frac{38 \div 2}{24 \div 2} = \frac{19}{12}$$

$$\frac{19}{12} = 1\frac{7}{12}$$

Solution $\frac{3}{4} + \frac{5}{6} = 1\frac{7}{12}$

Guided Practice

Suki rides her bicycle $\frac{5}{6}$ mile before seeing a sign that reads "Tybee Island: $\frac{3}{4}$ mile." If Suki rides to Tybee Island, how many miles will she travel in all?

Add to find the total miles.

The denominators of the fractions are _____ and _____.

Multiples of 6: _____

Multiples of 4: _____

The least number that is a common multiple of 6 and 4 is _____.

Find equivalent fractions with _____ as the common denominator.

$$\frac{5}{6} = \frac{5 \times 2}{6 \times 2} = \frac{\square}{\square}$$

$$\frac{3}{4} = \frac{3 \times \square}{4 \times \square} = \frac{\square}{\square}$$

Add.

$$\frac{\square}{12} + \frac{\square}{12} = \frac{\square}{\square}$$

Write your answer in simplest form: _____

Suki will ride _____ miles in all to reach Tybee Island.

Lesson Practice • Part 1

Choose the correct answer.

1. What is $\frac{4}{9} + \frac{1}{9}$?

   A. $\frac{1}{3}$

   B. $\frac{3}{9}$

   C. $\frac{5}{9}$

   D. $\frac{2}{3}$

2. What is $1\frac{3}{4} + 3\frac{1}{8}$?

   A. $4\frac{1}{3}$

   B. $4\frac{1}{2}$

   C. $4\frac{7}{8}$

   D. 5

3. Paulo shaded $\frac{1}{3}$ of a grid. Then he shaded another $\frac{2}{5}$ of the grid. What fraction of the grid did he shade?

   A. $\frac{1}{5}$

   B. $\frac{3}{10}$

   C. $\frac{3}{5}$

   D. $\frac{11}{15}$

4. What is $3\frac{5}{6} + 2\frac{2}{3}$?

   A. $5\frac{1}{3}$

   B. $5\frac{1}{2}$

   C. 6

   D. $6\frac{1}{2}$

5. Sophie takes tap and ballet. Today she practiced tap for $\frac{3}{4}$ hour and ballet for $\frac{1}{2}$ hour. How many hours did Sophie spend practicing dance?

   A. $\frac{2}{3}$ hour

   B. $1\frac{1}{4}$ hours

   C. $1\frac{3}{8}$ hours

   D. $1\frac{1}{2}$ hours

6. Frances has $5\frac{1}{6}$ yards of red yarn and $2\frac{5}{6}$ yards of blue yarn. How many yards of yarn does she have in all?

   A. $3\frac{2}{3}$ yards

   B. $7\frac{2}{3}$ yards

   C. $7\frac{5}{6}$ yards

   D. 8 yards

7. What is $\frac{7}{9} + \frac{1}{6}$?

   A. $\frac{17}{18}$

   B. $\frac{8}{9}$

   C. $\frac{15}{18}$

   D. $\frac{5}{6}$

8. What is $1\frac{5}{8} + 2\frac{3}{16}$?

   A. 4

   B. $3\frac{13}{16}$

   C. $3\frac{1}{2}$

   D. $3\frac{7}{16}$

9. Blake bought $\frac{3}{8}$ pound of cashew nuts, $\frac{1}{8}$ pound of almonds, and $\frac{5}{6}$ pound of walnuts.

   A. What is the total weight of the nuts that Blake bought? Write the answer in simplest form. Show your work.

   B. Explain how you found your answer for Part A.

Lesson Practice • Part 2

Choose the correct answer.

1. Which sum is less than 1?

   A. $\frac{3}{8} + \frac{2}{5}$

   B. $\frac{3}{5} + \frac{1}{2}$

   C. $\frac{2}{3} + \frac{3}{4}$

   D. $\frac{5}{8} + \frac{2}{3}$

2. Sebastian added $\frac{2}{3} + \frac{3}{5}$ and computed a sum of $\frac{5}{8}$. Which sentence is true?

   A. Sebastian is correct because $2 + 3 = 5$ and $3 + 5 = 8$.

   B. Sebastian is incorrect because $\frac{5}{8}$ is less than $\frac{3}{5}$.

   C. Sebastian is incorrect because $\frac{5}{8}$ is less than $\frac{2}{3}$.

   D. Sebastian is correct because when the addends are simplified the sum is $\frac{5}{8}$.

3. Skylar read a book for $2\frac{1}{4}$ hours and then spoke on the phone for $1\frac{1}{2}$ hours. How much time did Skylar spend reading and talking on the phone?

   A. $3\frac{1}{3}$ hours

   B. $3\frac{3}{4}$ hours

   C. $4\frac{1}{4}$ hours

   D. $4\frac{3}{4}$ hours

4. Ava made a rectangular drawing. The width of the drawing is $3\frac{1}{2}$ inches. The length is $1\frac{7}{8}$ inches longer than the width. What is the length of the drawing?

   A. $4\frac{4}{5}$ inches

   B. $5\frac{1}{8}$ inches

   C. $5\frac{1}{4}$ inches

   D. $5\frac{3}{8}$ inches

5. Find the sum.

   $\frac{5}{12} + \frac{3}{5} = \square$

   A. $1\frac{1}{30}$

   B. $1\frac{1}{60}$

   C. $\frac{59}{60}$

   D. $\frac{8}{17}$

6. Brooke walked $1\frac{1}{4}$ miles from her home to the park. She walked $\frac{5}{8}$ mile longer on the way home. How far did Brooke walk in all?

   A. $1\frac{1}{2}$ miles

   B. $1\frac{7}{8}$ miles

   C. $2\frac{1}{2}$ miles

   D. $3\frac{1}{8}$ miles

7. Which sum is greater than 1?

   A. $\frac{1}{2} + \frac{7}{12}$

   B. $\frac{1}{4} + \frac{2}{5}$

   C. $\frac{3}{8} + \frac{1}{4}$

   D. $\frac{2}{3} + \frac{1}{10}$

8. Camden jogged $3\frac{7}{10}$ miles in the park and then $\frac{3}{4}$ mile back home. How far did Camden jog in all?

   A. $4\frac{9}{20}$ miles

   B. $4\frac{2}{5}$ miles

   C. $4\frac{7}{20}$ miles

   D. $3\frac{11}{14}$ miles

9. Find the sum.

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

   A. $5\frac{7}{9}$

   B. $6\frac{1}{3}$

   C. $6\frac{1}{2}$

   D. $6\frac{2}{3}$

10. Emilia lives $1\frac{3}{5}$ miles east of school. Valentina lives $1\frac{1}{2}$ miles west of school. How far do Emilia and Valentina live from each other?

    A. $2\frac{4}{7}$ miles

    B. $2\frac{9}{10}$ miles

    C. 3 miles

    D. $3\frac{1}{10}$ miles

11. Of the DVDs sold at the Meloy garage sale, $\frac{1}{3}$ are comedies, $\frac{1}{4}$ are dramas, and $\frac{1}{6}$ are music.

    A. What fraction of the DVDs are comedies or dramas? Show your work.

    B. What fraction of the DVDs are dramas or music? Show your work.

    C. Did the Meloys sell any other type of DVDs? Explain your answer.

Lesson 10 Answers

Lesson 10

Guided Practice

The denominators of the fractions are **6** and **4**.

Multiples of 6: **6, 12, 18, 24, 30, 36**

Multiples of 4: **4, 8, 12, 16, 20, 24**

The least number that is a common multiple of 6 and 4 is **12**.

Find equivalent fractions with **12** as the common denominator.

$\frac{5}{6} = \frac{5 \times 2}{6 \times 2} = \frac{10}{12}$

$\frac{3}{4} = \frac{3 \times 3}{4 \times 3} = \frac{9}{12}$

$\frac{10}{12} + \frac{9}{12} = \frac{19}{12}$

Write your answer in simplest form: $1\frac{7}{12}$

Suki will ride $1\frac{7}{12}$ miles in all to reach Tybee Island.

Lesson Practice Part 1

1. C
2. C
3. D
4. D
5. B
6. D
7. A
8. B
9. A. $1\frac{1}{3}$ pounds

   B. Possible explanation:

   I found a common denominator of 24 for the fractions. $\frac{3}{8} = \frac{9}{24}$, $\frac{1}{8} = \frac{3}{24}$, $\frac{5}{6} = \frac{20}{24}$. Then I added the fractions: $\frac{9}{24} + \frac{3}{24} + \frac{20}{24} = \frac{32}{24}$. Then I wrote the answer in simplest form: $\frac{32}{24} = 1\frac{8}{24} = 1\frac{1}{3}$.

Lesson Practice Part 2

1. A
2. C
3. B
4. D
5. B
6. D
7. A
8. A
9. C
10. D
11. A. $\frac{7}{12}$; Possible work: $\frac{1}{3} + \frac{1}{4} = \frac{4}{12} + \frac{3}{12} = \frac{7}{12}$

    B. $\frac{5}{12}$; Possible work: $\frac{1}{4} + \frac{1}{6} = \frac{3}{12} + \frac{2}{12} = \frac{5}{12}$

    C. Yes; Possible explanation: I added $\frac{1}{3} + \frac{1}{4} + \frac{1}{6} = \frac{4}{12} + \frac{3}{12} + \frac{2}{12} = \frac{9}{12}$. Because $\frac{9}{12} < 1$, other types of DVDs had to have been sold.