5th Grade

Week 5: April 27-May 1

Math

Parent/Student Directions - Instrucciones para padres / estudiantes

Math: April 27th – May 1st 2020

Monday:

- Today you're going to read and work through **Lesson 9.7: Graph and Analyze Relationships** on pages 571-574.
- Here is a YouTube video that will help you with this lesson!
- https://www.youtube.com/watch?v=L2EvTIuPNKw
- Complete practice pages 575-576.

Lunes:

- Hoy leerá y trabajará en **la Lección 9.7: Graficar y analizar relaciones** en las páginas 571-574.
- ¡Aquí hay un video de YouTube que lo ayudará con esta lección!
- https://www.youtube.com/watch?v=L2EvTIuPNKw
- Complete las páginas de práctica 575-576.

Tuesday:

- Today you're going to read and work through **Lesson 10.1: Customary Length** on pages 585-587.
- Here is a YouTube video that will help you with this lesson!
- https://www.youtube.com/watch?v=kR1aMgdKbco
- Complete practice pages 589-590.

Martes:

- Hoy leerá y trabajará en **la Lección 10.1: Duración habitual** en las páginas 585-587.
- ¡Aquí hay un video de YouTube que lo ayudará con esta lección!
- https://www.youtube.com/watch?v=kR1aMgdKbco
- Complete las páginas de práctica 589-590.

Wednesday:

- Today you're going to read and work through **Lesson 10.2: Customary Capacity** on pages 591-593.
- Here is a YouTube video that will help you with this lesson!
- https://www.youtube.com/watch?v=i3KqYVCMCZo
- Complete practice page 595.

Miércoles:

- Hoy leerá y trabajará en **la Lección 10.2: Capacidad habitual** en las páginas 591-593.
- ¡Aquí hay un video de YouTube que lo ayudará con esta lección!
- https://www.youtube.com/watch?v=i3KqYVCMCZo
- Completa la página de práctica 595.

Thursday:

- This is a catch-up day. Students can use the day to complete any unfinished assignments and get any questions answered they may have by their teacher. You can ask me questions through Dojo, email, text message, or phone call. Use the rest of your day to “sharpen the saw!”

Jueves:

- Este es un día de recuperación. Los estudiantes pueden usar el día para completar cualquier tarea no terminada y obtener cualquier pregunta que su maestro pueda responder. Puede hacerme preguntas a través de Dojo, correo electrónico, mensaje de texto o llamada telefónica. Use el resto de su día para "afilar la sierra".

Friday:

- Today you are going to learn and test your knowledge of adding and subtracting fractions and mixed numbers which you have practiced throughout the Galileo dialog! Answer the Galileo questions. You can use any information and resources in your packet to help you. Take your time! You’ve got this!

Viernes:

- ¡Hoy aprenderás y probarás tu conocimiento de sumar y restar fracciones y números mixtos que has practicado a lo largo del diálogo de Galileo! Responde las preguntas de Galileo. Puede usar cualquier información y recursos en su paquete para ayudarlo. ¡Tome su tiempo! ¡Tienes esto!

Name _____

Graph and Analyze Relationships

Essential Question How can you write and graph ordered pairs on a coordinate grid using two numerical patterns?

Common Core Operations and Algebraic Thinking—5.OA.B.3

MATHEMATICAL PRACTICES MP4, MP7

Unlock the Problem

Real World

Sasha is making hot cocoa for a party. For each mug of cocoa, he uses 3 tablespoons of cocoa mix and 6 fluid ounces of hot water. If Sasha uses an entire 18-tablespoon container of cocoa mix, how many fluid ounces of water will he use?

- How many tablespoons of cocoa mix does Sasha add for each mug of cocoa?

- How many fluid ounces of water does Sasha add for each mug of cocoa?

STEP 1 Use the two given rules in the problem to generate the first four terms for the number of tablespoons of cocoa mix and the number of fluid ounces of water.

Cocoa Mix (tbsp)	3				...	18
Water (fl oz)	6				...	

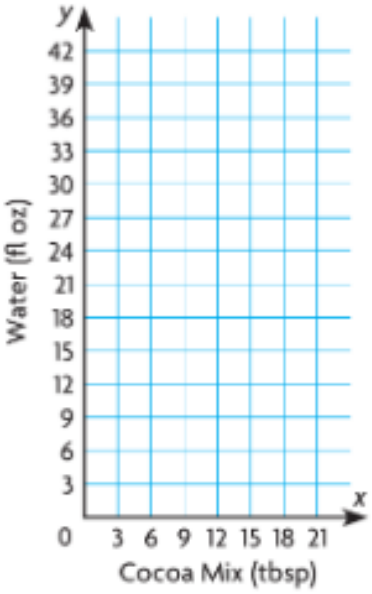
STEP 2 Write the number pairs as ordered pairs, relating the number of tablespoons of cocoa mix to the number of fluid ounces of water.

(3, 6) _____ _____ _____

STEP 3 Graph and label the ordered pairs. Then write a rule to describe how the number pairs are related.

- What rule can you write that relates the amount of cocoa mix to water?

_____



So, Sasha will use _____ fluid ounces of water if he uses the entire container of cocoa mix.

- MATHEMATICAL PRACTICE 7 **Look for Structure** Write the final number pair as an ordered pair. Then graph and label it. Starting at the origin, connect the points with straight line segments. What do the connected points form? Explain why this is formed.

_____

_____

_____

Try This! **Find the unknown term in the table.**

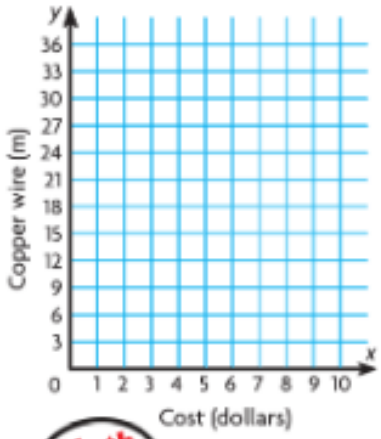
Each $2-bag of copper wire contains 6 meters of wire.

Write the number pairs as ordered pairs and graph the data. Then write a rule that relates the cost to the number of meters of copper wire.

Think: Multiply the number of dollars by _____ to find the number of meters of copper wire.

Find the unknown term in the table.

Cost (dollars)	2	4	6	8
Copper wire (m)	6	12	18	



Math Talk MATHEMATICAL PRACTICES 7

Look for a Pattern How are the terms in each sequence related? How is one sequence related to the other?

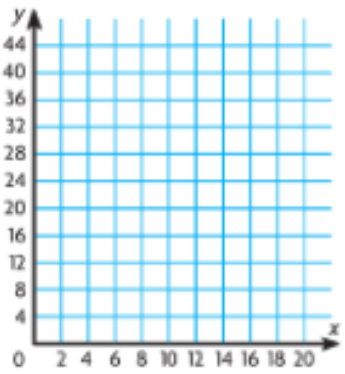
Share and Show MATH BOARD

Graph and label the related number pairs as ordered pairs. Complete the rule that describes how one sequence is related to the other. Then use the rule to find the unknown term.

1. For every 2 square feet of lawn, Charlie needs 8 ounces of fertilizer.

Lawn (sq ft)	2	4	6	8	10
Weight (oz)	8	16	24	32	

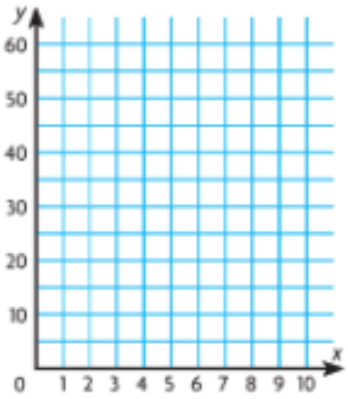
Multiply the number of square feet by _____ to find the ounces of fertilizer needed.



2. On Mary's map, every 2 inches represents 10 miles.

Map (in.)	2	4	6	8	10
Miles	10	20	30	40	

Multiply the number of inches by _____ to find the distance in miles.



Name _____

On Your Own

3. GO DEEPER On Sandy's scale drawing of the school campus, 2 inches equals 4 yards. The distance between the swings and the track is 10 inches on the drawing, and the distance between the track and the basketball court is 4 inches on the drawing. How much farther is the track from the swings than from the basketball court, in actual distance?

Draw your own graph. Write a rule that describes how one sequence of terms is related to the other. Complete the table and solve.

Map (in.)	2	4	6	8	10
Distance (yds)	4	8	12	16	

Rule: _____

_____

_____

_____

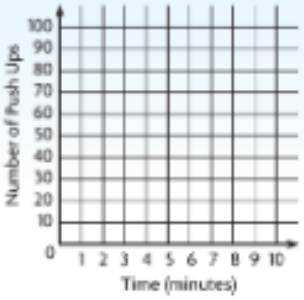
4. THINK SMARTER Eric recorded the total number of push ups he did each minute for 4 minutes.

Time (minutes)	1	2	3	4
Number of Push Ups	15	30	45	60

Write the number pairs as ordered pairs.

_____

Graph the ordered pairs on a coordinate plane.



Write a rule to describe how the number pairs are related.

_____

_____

Problem Solving • Applications (Real World)

THINK SMARTER **Sense or Nonsense?**

Math on the Spot

5. Elsa solved the following problem.

Lou and George are making chili for the Annual Firefighter's Ball. Lou uses 2 teaspoons of hot sauce for every 2 cups of chili that he makes, and George uses 3 teaspoons of the same hot sauce for every cup of chili in his recipe. Who has the hotter chili, George or Lou?

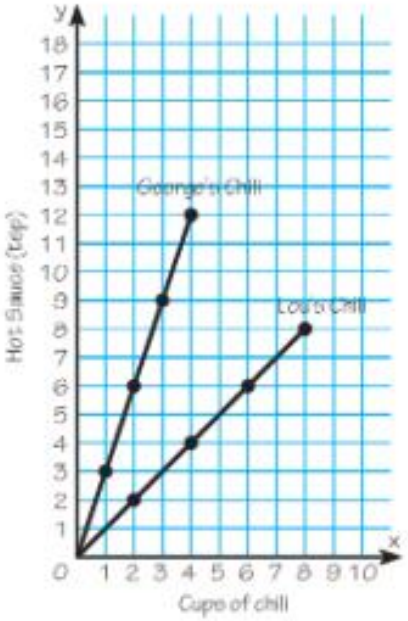
Write the related number pairs as ordered pairs and then graph them. Use the graph to compare who has the hotter chili, George or Lou.

Lou's chili (cups)	2	4	6	8
Hot sauce (tsp)	2	4	6	8

George's chili (cups)	1	2	3	4
Hot sauce (tsp)	3	6	9	12

Lou's chili: (2, 2), (4, 4), (6, 6), (8, 8)

George's chili: (1, 3), (2, 6), (3, 9), (4, 12)



Elsa said that George's chili was hotter than Lou's, because the graph showed that the amount of hot sauce in George's chili was always 3 times as great as the amount of hot sauce in Lou's chili. Does Elsa's answer make sense, or is it nonsense? Explain.

Name _____

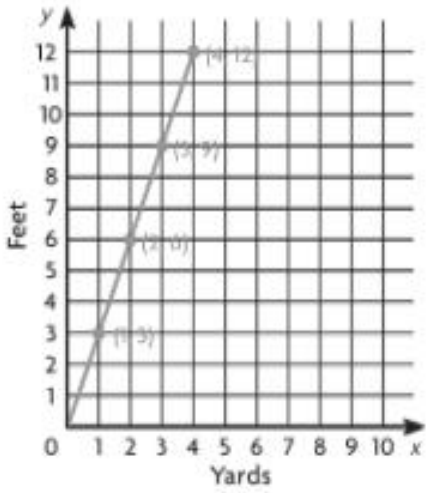
Graph and Analyze Relationships

COMMON CORE STANDARD—5.OA.B.3, 5.G.A.2 *Analyze patterns and relationships.*

Graph and label the related number pairs as ordered pairs. Then complete and use the rule to find the unknown term.

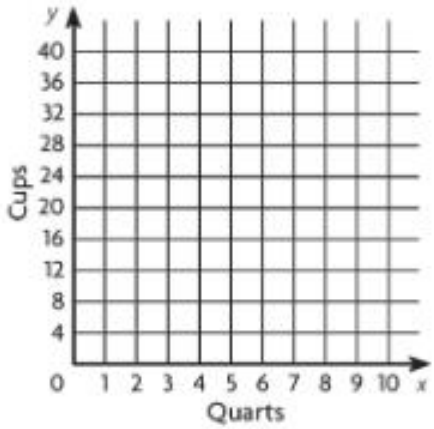
1. Multiply the number of yards by 3 to find the number of feet.

Yards	1	2	3	4
Feet	3	6	9	12



2. Multiply the number of quarts by _____ to find the number of cups that measure the same amount.

Quarts	1	2	3	4	5
Cups	4	8	12	16	



Problem Solving Real World

3. How can you use the graph for Exercise 2 to find how many cups are in 9 quarts?

_____

_____

_____

_____

_____

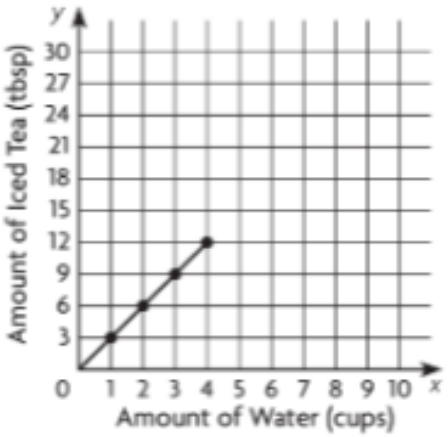
_____

4. How many cups are equal to 9 quarts? _____

Lesson Check (5.OA.B.3)

Use the data to complete the graph. Then answer the questions.

Paola is making a pitcher of iced tea. For each cup of water, she uses 3 tablespoons of powdered iced tea mix.



1. Fill in the missing number to complete the following rule.

Multiply the amount of iced tea mix by _____ to get the amount of water.

2. Suppose Paola uses 18 tablespoons of iced tea mix. How many cups of water does she need to use?

_____

Spiral Review (5.NBT.A.2, 5.NBT.B.6, 5.NBT.B.7)

3. A biologist counted 10,000 migrating monarch butterflies. How do you express 10,000 as a power of 10?

_____

4. Find the quotient. Write your answer using a decimal and round to the nearest hundredth.

$8{,}426 \div 82$

_____

5. What is $54.38 \div 29.7$?

_____

6. On a certain day, $1 is worth 30.23 Russian rubles. Omar has $75. How many rubles will he get in exchange?

_____

Name _____

Customary Length

Essential Question How can you compare and convert customary units of length?

Common Core — Measurement and Data—5.MD.A.1

MATHEMATICAL PRACTICES MP1, MP6, MP7

Unlock the Problem (Real World)

To build a new swing, Mr. Mattson needs 9 feet of rope for each side of the swing and 6 more feet for the monkey bar. The hardware store sells rope by the yard.

- How many feet of rope does Mr. Mattson need for the swing? _____
- How many feet does Mr. Mattson need for the swing and the monkey bar combined? _____

Mr. Mattson needs to find how many yards of rope he needs to buy. He will need to convert 24 feet to yards. How many groups of 3 feet are in 24 feet?

A 12-inch ruler is 1 foot.		
A yardstick is 1 yard.		

_____ feet = 1 yard

Use a bar model to write an equation.

MODEL

RECORD

total feet		feet in 1 yard		total yards
↓		↓		↓
24	÷	_____	=	_____

So, Mr. Mattson needs to buy _____ yards of rope.

Math Talk MATHEMATICAL PRACTICES 6

What operation did you use when you found groups of 3 feet in 24 feet? Do you multiply or divide when you convert a smaller unit to a larger unit? Explain.

Example 1 Use the table to find the relationship between miles and feet.

Customary Units of Length
1 foot (ft) = 12 inches (in.)
1 yard (yd) = 3 ft
1 mile (mi) = 5,280 ft
1 mile = 1,760 yd

The distance between the new high school and the football field is 2 miles. How does this distance compare to 10,000 feet?

When you convertlarger units to smaller units, you need to multiply.

STEP 1 Convert 2 miles to feet.

Think: 1 mile is equal to 5,280 feet.

I need to _____ the total number of miles by _____.

total miles ↓ | feet in 1 mile ↓ | total feet ↓

2 × _____ = _____

2 miles = _____ feet

STEP 2 Compare. Write <, >, or =.

_____ feet ◯ 10,000 feet

Since _____ is _____ than 10,000, the distance between the new high school and the football field is _____ than 10,000 feet.

Example 2 Convert to mixed measures.

Mixed measures use more than one unit of measurement. You can convert a single unit of measurement to mixed measures.

Convert 62 inches into feet and inches.

STEP 1 Use the table.

Think: 12 inches is equal to 1 foot

I am changing from a smaller unit to a larger unit, so I _____.

STEP 2 Convert.

total inches ↓ | inches in 1 foot ↓ | feet ↓ | inches ↓

62 ÷ _____ is _____ r _____

So, 62 inches is equal to _____ feet _____ inches.

- MATHEMATICAL PRACTICE 6 **Explain** how to convert the mixed measures, 12 yards 2 feet, to a single unit of measurement in feet. How many feet is it?

_____

Name _____

Share and Show

MATH BOARD

Convert.

1. 2 mi = _____ yd

2. 6 yd = _____ ft

3. 90 in. = _____ ft _____ in.

Math Talk

MATHEMATICAL PRACTICES 1

Make Sense of Problems

How do you know when to multiply to convert a measurement?

On Your Own

Practice: Copy and Solve **Convert.**

4. 125 in. = ■ ft ■ in.

5. 48 ft = ■ yd ■ ft

6. 42 yd 2 ft = ■ ft

Compare. Write <, >, or =.

7. 8 ft ◯ 3 yd

8. 2 mi ◯ 10,500 ft

9. 3 yd 2 ft ◯ 132 in.

10. GO DEEPER Terry is making 6 hat and scarf sets. Each scarf requires 2 yards of material and each hat requires 18 inches of material. How many feet of material does he need for all 6 hat and scarf sets?

_____

11. THINK SMARTER Choose the correct word and number to complete the sentence.

Katy's driveway is 120 feet long.

To convert feet to yards, I need to [add / subtract / multiply / divide] 120 by [3 / 12 / 1,760 / 5,280].

Name _____

Customary Length

COMMON CORE STANDARD—5.MD.A.1
Convert like measurement units within a given measurement system.

Convert.

1. 12 yd = 36 ft

total yards | feet in 1 yard | total feet

12 × 3 = 36

12 yards = 36 feet

2. 5 ft = _____ in.

3. 5 mi = _____ ft

4. 240 in. = _____ ft

5. 100 yd = _____ ft

6. 10 ft = _____ in.

7. 150 in. = _____ ft _____

8. 7 yd 2 ft = _____ ft

9. 10 mi = _____ ft

Compare. Write <, >, or =.

10. 23 in. ◯ 2 ft

11. 25 yd ◯ 75 ft

12. 6,200 ft ◯ 1 mi 900 ft

13. 100 in. ◯ 3 yd 1 ft

14. 1,000 ft ◯ 300 yd

15. 500 in. ◯ 40 ft

Problem Solving Real World

16. Marita orders 12 yards of material to make banners. If she needs 1 foot of fabric for each banner, how many banners can she make?

_____

_____

17. Christy bought an 8-foot piece of lumber to trim a bookshelf. Altogether, she needs 100 inches of lumber for the trim. Did Christy buy enough lumber? Explain.

_____

_____

18. WRITE *Math* Explain how to compare two lengths that are measured in different-sized units.

_____

_____

Lesson Check (5.MD.A.1)

1. Jenna's garden is 5 yards long. How long is her garden in feet?

2. Ellen needs to buy 180 inches of ribbon to wrap a large present. The store sells ribbon only in whole yards. How many yards does Ellen need to buy to have enough ribbon?

Spiral Review (5.OA.B.3, 5.NF.B.6, 5.NF.B.4a)

3. McKenzie works for a catering company. She is making iced tea for an upcoming event. For each container of tea, she uses 16 tea bags and 3 cups of sugar. If McKenzie uses 64 tea bags, how many cups of sugar will she use?

4. Javier bought 48 sports cards at a yard sale. Of the cards, $\frac{3}{8}$ werebaseball cards. How many cards were baseball cards?

5. What is the quotient of 396 divided by 12?

6. What is the unknown number in Sequence 2 in the chart? What rule can you write that relates Sequence 2 to Sequence 1?

Sequence Number	1	2	3	8	10
Sequence 1	4	8	12	32	40
Sequence 2	8	16	24	64	?

FOR MORE PRACTICE GO TO THE Personal Math Trainer

Name _____

Customary Capacity

Essential Question How can you compare and convert customary units of capacity?

Common Core Measurement and Data—5.MD.A.1

MATHEMATICAL PRACTICES MP2, MP4, MP6

Unlock the Problem

Mara has a can of paint with 3 cups of purple paint in it. She also has a bucket with a capacity of 26 fluid ounces. Will the bucket hold all of the paint Mara has?

- What capacity does Mara need to convert?

- After Mara converts the units, what does she need to do next?

The **capacity** of a container is the amount the container can hold.

1 cup (c) = _____ fluid ounces (fl oz)

Use a bar model to write an equation.

STEP 1 Convert 3 cups to fluid ounces.

MODEL

RECORD

total cups		flozin 1 cup		total fl oz
3	×	____	=	____

STEP 2 Compare. Write <, >, or =.

_____ fl oz ◯ 26 fl oz

Since _____ fluid ounces is _____ than 26 fluid ounces,

Mara's bucket _____ hold all of the paint.

- MATHEMATICAL PRACTICE 6 What if Mara has 7 cups of green paint and a container filled with 64 fluid ounces of yellow paint? Which color paint does Mara have more of? **Explain** your reasoning.

Example

Coral made 32 pints of fruit punch for a party. She needs to carry the punch in 1-gallon containers. How many containers does Coral need?

To convert a smaller unit to a larger unit, you need to divide. Sometimes you may need to convert more than once.

Customary Units of Capacity
1 cup (c) = 8 fluid ounces (fl oz)
1 pint (pt) = 2 cups
1 quart (qt) = 2 pints
1 gallon (gal) = 4 quarts

Convert 32 pints to gallons.

STEP 1 Write an equation to convert pints to quarts.

total pints ↓ | pints in 1 qt ↓ | total quarts ↓

32 ◯ ___ ◯ ___

STEP 2 Write an equation to convert quarts to gallons.

total quarts ↓ | quarts in 1 gal ↓ | total gallons ↓

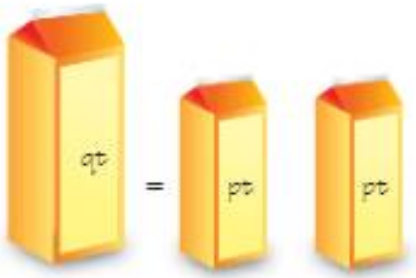
___ ◯ ___ ◯ ___

So, Coral needs _____ 1-gallon containers to carry the punch.

Share and Show

MATH BOARD

1. Use the picture to complete the statements and convert 3 quarts to pints.



a. 1 quart = _____ pints

b. 1 quart is _____ than 1 pint.

c. 3 qt ◯ _____ pt in 1 qt = _____ pt

Convert.

2. 3 gal = _____ pt

3. 5 qt = _____ pt

4. 6 qt = _____ c

Math Talk MATHEMATICAL PRACTICES 2

Reason Abstractly Explain how converting units of capacity is similar to converting units of length. How is it different?

Name _____

On Your Own

Convert.

5. 38 c = _____ pt

6. 36 qt = _____ gal

7. 104 fl oz = _____ c

Practice: Copy and Solve **Convert.**

8. 200 c = ▢ qt

9. 22 pt = ▢ fl oz

10. 8 gal = ▢ qt

11. 72 fl oz = ▢ c

12. 2 gal = ▢ pt

13. 48 pt = ▢ gal

Compare. Write <, >, or =.

14. 28 c ◯ 14 pt

15. 25 pt ◯ 13 qt

16. 20 qt ◯ 80 c

17. 12 gal ◯ 50 qt

18. 320 fl oz ◯ 18 pt

19. 15 qt ◯ 63 c

20. WRITE ▸ *Math* Which of exercises 14–19 could you solve mentally? Explain your answer for one exercise.

21. GO DEEPER Larry made 4 batches of punch. Each batch uses 16 fluid ounces of lemon juice and 3 pints of orange juice. If each serving is 1 cup, how many servings did he make all together?

Name _____

Customary Capacity

COMMON CORE STANDARD—5.MD.A.1
Convert like measurement units within a given measurement system.

Convert.

1. 5 gal = 40 pt
   Think: 1 gallon = 4 quarts
   1 quart = 2 pints
2. 192 fl oz = _____ pt
3. 15 pt = _____ c
4. 240 fl oz = _____ c
5. 32 qt = _____ gal
6. 10 qt = _____ c
7. 48 c = _____ qt
8. 72 pt = _____ gal
9. 128 fl oz = _____ pt

Compare. Write <, >, or =.

10. 17 qt ◯ 4 gal
11. 96 fl oz ◯ 8 pt
12. 400 pt ◯ 100 gal
13. 100 fl oz ◯ 16 pt
14. 74 fl oz ◯ 8 c
15. 12 c ◯ 3 qt

Problem Solving Real World

16. Vickie made a recipe for 144 fluid ounces of scented candle wax. How many 1-cup candle molds can she fill with the recipe?

_____

17. A recipe calls for 32 fluid ounces of heavy cream. How many 1-pint containers of heavy cream are needed to make the recipe?

_____

18. WRITE Math Give some examples of when you would measure capacity in each of the units of capacity shown in the table on page 592.

_____

_____

Slide 1

What You Will Learn

You will learn how to add and subtract proper fractions and mixed numbers that have different denominators. You will need to do regrouping in some of the problems.

Slide 2

Key Words

Proper fraction - a fraction whose numerator is smaller than its denominator

Improper fraction - a fraction whose numerator is greater than the denominator

Mixed numbers - a number shown as a whole number next to a fraction, it is equal to the sum of the whole number and the fraction (e.g., 1¾)

Numerator - the number of parts remaining out of the whole; it is found above the fraction bar (e.g., 3 in the fraction ¾)

Denominator - the bottom part of a fraction that shows the number of equal parts that the whole is divided into (e.g., 4 in the fraction ¾)

Lowest terms - if the numerator and denominator of a fraction have no common factor greater than 1, then the fraction is in the lowest terms possible (e.g., 1/2, 3/8, 4/5)

Simplify - writing a quantity in its simplest form or lowest terms (e.g., 2/4 = 1/2)

Regrouping - rearranging groups into new groups

ADDING AND SUBTRACTING FRACTIONS AND MIXED NUMBERS

In this Lesson, we will answer the following:

1. How do we add or subtract fractions?
2. How do we add fractions with different denominators?
3. What number should we choose as the common denominator?
4. How do we add mixed numbers?

Section 2

Subtracting mixed numbers.

A FRACTION IS A NUMBER we need for measuring; therefore we sometimes have to add or subtract them. Now, to add or subtract anything, the *names* -- the units -- must be the same.

2 apples + 3 apples = 5 apples.

We cannot add 2 apples plus 3 oranges -- at least not until we call them "pieces of fruit."

In the name of a fraction -- "2 ninths," for example -- *ninths* is the name of what we are adding.

2 ninths + 3 ninths = 5 ninths.

That unit will appear as the denominator.

1. How do we add or subtract fractions?

$$\frac{2}{9} + \frac{3}{9} = \frac{5}{9}$$

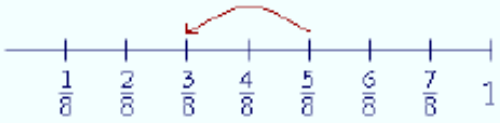
The names of what we are adding or subtracting -- the denominators -- must be the same. Add or subtract only the numerators, and keep that same denominator.

Example 1. $\frac{5}{8}+\frac{2}{8}=\frac{7}{8}$.

"5 eighths + 2 eighths = 7 eighths."

The denominator of a fraction has but one function, which is to *name* what we are counting. In this example, we are counting *eighths*.

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



Fractions with different denominators

To add or subtract fractions, the denominators *must* be the same. Before continuing, then, the student should know how to convert one fraction to an equivalent one, by multiplying the numerator and the denominator.

2. How do we add fractions with different denominators?

$$\frac{2}{3}+\frac{1}{4}$$

Convert each fraction to an equivalent fraction with the *same* denominator.

3. What number should we choose as the common denominator?

Choose a common multiple of the original denominators. Choose their *lowest* common multiple. (Lesson 23.)

We choose a common multiple of the denominators because we change a denominator by multiplying it. Lesson 22.

Example 3. $\frac{2}{3}+\frac{1}{4}$.

Solution. The lowest common multiple of 3 and 4 is their product, 12. (Lesson 22, Question 4.)

We will convert each fraction to an equivalent fraction with denominator 12.

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

$$=\frac{11}{12}.$$

We converted $\frac{2}{3}$ to $\frac{8}{12}$ by saying, "3 goes into (is contained in) 12 *four* times. Four times 2 is 8."

(In that way, we multiplied both 2 and 3 by the same number, namely 4. See Lesson 22, Question 3.)

We converted $\frac{1}{4}$ to $\frac{3}{12}$ by saying, "4 goes into 12 *three* times. Three times 1 is 3." (We multiplied both 1 and 4 by 3.)

The fact that we *say* what we do shows again that arithmetic is a spoken skill.

In practice, it is necessary to write the common denominator only once:

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

Example 4. $\frac{4}{5}+\frac{2}{15}$

Solution. The LCM of 5 and 15 is 15. Therefore,

$\frac{4}{5}+\frac{2}{15}=\frac{12+2}{15}=\frac{14}{15}$.

We changed $\frac{4}{5}$ to $\frac{12}{15}$ by saying, "5 goes into 15 *three* times. Three times 4 is 12."

We did not change $\frac{2}{15}$, because we are not changing the denominator 15.

Example 5. $\frac{2}{3}+\frac{1}{6}+\frac{7}{12}$

Solution. The LCM of 3, 6, and 12 is 12.

$\frac{2}{3}+\frac{1}{6}+\frac{7}{12}=\frac{8+2+7}{12}$

$=\frac{17}{12}$

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

We converted $\frac{2}{3}$ to $\frac{8}{12}$ by saying, "3 goes into 12 *four* times. Four times 2 is 8."

We converted $\frac{1}{6}$ to $\frac{2}{12}$ by saying, "6 goes into 12 *two* times. Two times 1 is 2."

We did not change $\frac{7}{12}$, because we are not changing the

denominator 12.

Finally, we changed the improper fraction $\frac{17}{12}$ to $1\frac{5}{12}$ by

dividing 17 by 12. (Lesson 20.)

"12 goes into 17 one (1) time with remainder 5."

Example 6. $\frac{5}{6}+\frac{7}{9}$

Solution. The LCM of 6 and 9 is 18.

$$\frac{5}{6} + \frac{7}{9} = \frac{15+14}{18} = \frac{29}{18} = 1\frac{11}{18}.$$

We changed $\frac{5}{6}$ to $\frac{15}{18}$ by multiplying both terms by 3.

We changed $\frac{7}{9}$ to $\frac{14}{18}$ by multiplying both terms by 2.

Example 7. Add mentally $\frac{1}{2}+\frac{1}{4}$.

Answer. $\frac{1}{2}$ is how many $\frac{1}{4}$'s?

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

Just as 1 is half of 2, so 2 is half of 4. Therefore,

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

The student should not have to write any problem in which one of the fractions is $\frac{1}{2}$, and the denominator of the other is even.

For example,

$\frac{1}{2}+\frac{2}{10}=\frac{7}{10}$

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

Example 8. In a recent exam, one eighth of the students got A, two fifths got B, and the rest got C. What fraction got C?

Solution. Let 1 represent the whole number of students. Then the question is:

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

Now,

$\frac{1}{8}+\frac{2}{5}=\frac{5+16}{40}=\frac{21}{40}$.

The rest, the fraction that got C, is the complement of $\frac{21}{40}$.

It is $\frac{19}{40}$.

4. How do we add mixed numbers?

$4\frac{3}{8}+2\frac{2}{8}$

Add the whole numbers and add the fractions separately.

Example 9. $4\frac{3}{8}+2\frac{2}{8}=6\frac{5}{8}$.

Example 10. $3\frac{2}{5}+1\frac{4}{5}=4\frac{6}{5}$.

But $\frac{6}{5}$ is improper, we must change it to a mixed number:

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

Therefore,

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

Example 11.

$$6\tfrac{3}{4}$$
$$+\ 3\tfrac{5}{8}$$

Solution. When the denominators are different, we may arrange the work vertically; although that is not necessary.

To add the fractions, the denominators must be the same. The LCM of 4 and 8 is 8. We will change $\frac{3}{4}$ to $\frac{6}{8}$ -- by multiplying both terms by 2:

$$6\tfrac{3}{4} = 6\tfrac{6}{8}$$
$$+\ 3\tfrac{5}{8} = 3\tfrac{5}{8}$$
$$9\tfrac{11}{8} = 9 + 1\tfrac{3}{8}$$
$$= 10\tfrac{3}{8}.$$

We added $6 + 3 = 9$. $\frac{6}{8} + \frac{5}{8} = \frac{11}{8} = 1\frac{3}{8}$.

$9 + 1\ \frac{3}{8}\ = 10\ \frac{3}{8}$.

Slide 4

What is the solution?

$\frac{2}{3} - \frac{5}{12}$

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

B) $\frac{1}{4}$

C) $\frac{1}{6}$

D) $\frac{1}{12}$

Slide 5

What is the solution?

$\frac{4}{9} + \frac{6}{7} =$

A) $1\frac{19}{63}$

B) $1\frac{1}{9}$

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

D) $\frac{8}{21}$

Slide 6

Which is the solution, in lowest terms, to the problem below?

$$\begin{array}{r} 4\frac{3}{8} \\ +\ 3\frac{1}{4} \\ \hline \end{array}$$

A) $6\frac{7}{8}$

B) $7\frac{4}{12}$

C) $7\frac{1}{3}$

D) $7\frac{5}{8}$

Slide 7

What You Learned

You learned how to add and subtract proper fractions and mixed numbers that have different denominators.

Math with Fractions: Unlike Denominators Test

1) What is the solution?

$\frac{3}{5} - \frac{1}{3} =$

A) 1

B) $\frac{14}{15}$

C) $\frac{1}{2}$

D) $\frac{4}{15}$

---

2) What is the solution?

$\frac{1}{6} - \frac{5}{36} =$

A) $\frac{1}{36}$

B) $\frac{1}{18}$

C) $\frac{1}{6}$

D) $\frac{1}{4}$