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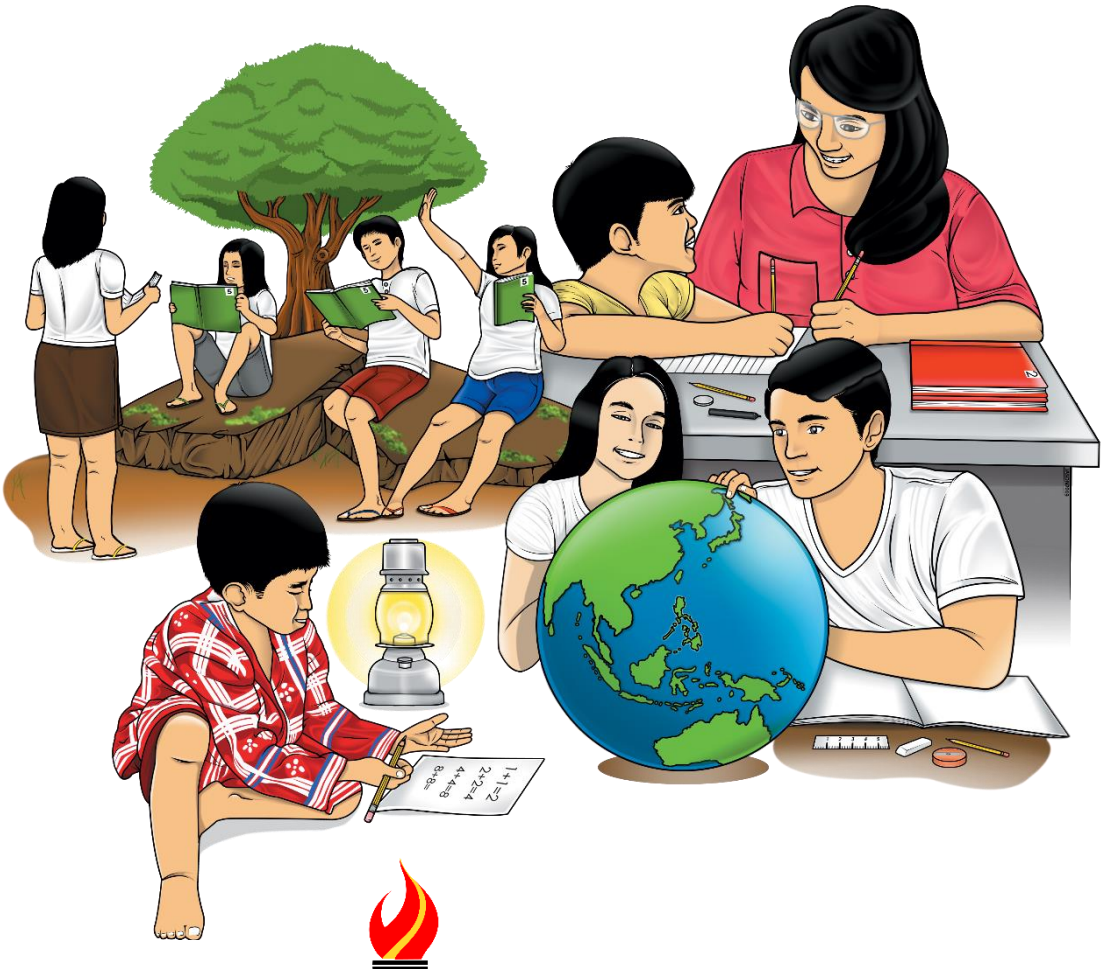
Mathematics

Quarter 1 – Module 4:
Dividing Simple Fractions and Mixed Fractions



ALTERNATIVE DELIVERY MODE
ADM

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Mathematics – Grade 6
Alternative Delivery Mode
Quarter 1 – Module 4: Dividing Simple Fractions and Mixed Fractions
First Edition, 2020

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Mathematics

Quarter 1 – Module 4:
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Introductory Message

For the facilitator:

Welcome to the Mathematics 6 Alternative Delivery Mode (ADM) Module on Dividing Simple Fractions and Mixed Fractions!

This module was collaboratively designed, developed and reviewed by educators both from public and private institutions to assist you, the teacher or facilitator in helping the learners meet the standards set by the K to 12 Curriculum while overcoming their personal, social, and economic constraints in schooling.

This learning resource hopes to engage the learners into guided and independent learning activities at their own pace and time. Furthermore, this also aims to help learners acquire the needed 21st century skills while taking into consideration their needs and circumstances.

In addition to the material in the main text, you will also see this box in the body of the module:

Notes to the Teacher

This contains helpful tips or strategies that will help you in guiding the learners.

As a facilitator, you are expected to orient the learners on how to use this module. You also need to keep track of the learners' progress while allowing them to manage their own learning. Furthermore, you are expected to encourage and assist the learners as they do the tasks included in the module.

For the learner:

Welcome to the Mathematics 6 Alternative Delivery Mode (ADM) Module on Dividing Simple Fractions and Mixed Fractions!

This module was designed to provide you with fun and meaningful opportunities for guided and independent learning at your own pace and time. You will be enabled to process the contents of the learning resource while being an active learner.

This module has the following parts and corresponding icons:

 ***What I Need to Know***	This will give you an idea of the skills or competencies you are expected to learn in the module.
 ***What I Know***	This part includes an activity that aims to check what you already know about the lesson to take. If you get all the answers correct (100%), you may decide to skip this module.
 ***What's In***	This is a brief drill or review to help you link the current lesson with the previous one.
 ***What's New***	In this portion, the new lesson will be introduced to you in various ways; a story, a song, a poem, a problem opener, an activity or a situation.
 ***What is It***	This section provides a brief discussion of the lesson. This aims to help you discover and understand new concepts and skills.
 ***What's More***	This comprises activities for independent practice to solidify your understanding and skills of the topic. You may check the answers to the exercises using the Answer Key at the end of the module.
 ***What I Have Learned***	This includes questions or blank sentence/paragraph to be filled in to process what you learned from the lesson.
 ***What I Can Do***	This section provides an activity which will help you transfer your new knowledge or skill into real life situations or concerns.
 ***Assessment***	This is a task which aims to evaluate your level of mastery in achieving the learning competency.
 ***Additional Activities***	In this portion, another activity will be given to you to enrich your knowledge or skill of the lesson learned.

Answer Key — This contains answers to all activities in the module.

At the end of this module you will also find:

References — This is a list of all sources used in developing this module.

The following are some reminders in using this module:

1. Use the module with care. Do not put unnecessary mark/s on any part of the module. Use a separate sheet of paper in answering the exercises.
2. Don't forget to answer *What I Know* before moving on to the other activities included in the module.
3. Read the instruction carefully before doing each task.
4. Observe honesty and integrity in doing the tasks and checking your answers.
5. Finish the task at hand before proceeding to the next.
6. Return this module to your teacher/facilitator once you are through with it.

If you encounter any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator. Always bear in mind that you are not alone.

We hope that through this material, you will experience meaningful learning and gain deep understanding of the relevant competencies. You can do it!

What I Need to Know

This module was designed and written with you in mind. It is here to help you master to divide simple fractions and mixed fractions. The scope of this module permits it to be used in many different learning situations. The language used recognizes the diverse vocabulary level of students. The lessons are arranged to follow the standard sequence of the course. But the order in which you read them can be changed to correspond with the textbook you are now using.

The module is divided into three lessons, namely:

- Lesson 1 – Dividing Simple Fractions
- Lesson 2 – Dividing Mixed Fractions
- Lesson 3 – Dividing Simple Fractions and Mixed Fractions

After going through this module, you are expected to:

1. divide simple fractions; **(M6NS -Ic-96.2)**
2. divide mixed fractions; **(M6NS -Ic-96.2)**
3. divide simple fractions and mixed fractions; **(M6NS -Ic-96.2)** and
4. solve routine or non-routine problems involving division without or with any of the other operations of fractions and mixed fractions using appropriate problem-solving strategies and tools. **(M6NS-Ic-97.2)**

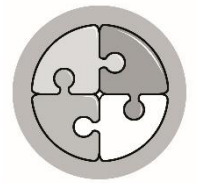
What I Know

Divide and express your answers in lowest term. Write your answers on your answer sheet.

1. $\frac{3}{4} \div \frac{2}{5} =$ ☐
2. $\frac{3}{8} \div \frac{2}{12} =$ ☐
3. $\frac{4}{10} \div \frac{1}{2} =$ ☐
4. $\frac{6}{9} \div \frac{8}{5} =$ ☐
5. $\frac{10}{12} \div \frac{7}{8} =$ ☐
6. $\frac{9}{15} \div \frac{1}{4} =$ ☐
7. $\frac{3}{4} \div \frac{12}{4} =$ ☐
8. $\frac{1}{2} \div \frac{1}{4} =$ ☐
9. $\frac{1}{3} \div \frac{4}{6} =$ ☐
10. $\frac{3}{14} \div \frac{1}{5} =$ ☐

Lesson 1 Dividing Simple Fractions

Dividing fractions is just about as easy as multiplying them. The knowledge in finding the reciprocal is applicable. In dividing mixed fractions, we are looking for the reciprocal of the divisor and applying the concept in multiplying fractions.



What's In

A. Give the product. Express your answer in lowest term. Write your answers on your answer sheet.

1. $\frac{1}{5} \times \frac{4}{5} = \square$
2. $\frac{2}{5} \times \frac{5}{6} = \square$
3. $\frac{4}{7} \times \frac{2}{3} = \square$

B. Give the reciprocal of the following fractions. Write your answers in your answer sheet.

4. $\frac{3}{4}$
5. $\frac{2}{5}$
6. $\frac{1}{4}$
7. $\frac{4}{12}$
8. $\frac{3}{10}$

What's New

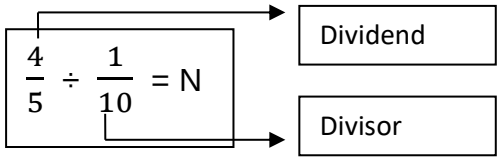
Study this problem.

Leo has $\frac{4}{5}$ m long of wood. He will cut it equally into $\frac{1}{10}$ m long each. How many pieces of wood with equal length will he cut?

What is It

In dividing simple fractions you need to multiply the dividend to the reciprocal of the divisor. The inverted form of the divisor is called the **reciprocal.** Example $\frac{3}{5}$, its reciprocal is $\frac{5}{3}$.

To get the answer, we can write the division equation as:



Step 1. Get the reciprocal of the divisor.

The reciprocal of $\frac{1}{10}$ is $\frac{10}{1}$.

Step 2. Multiply the dividend to the reciprocal of the divisor.

So, the equation $\frac{4}{5} \div \frac{1}{10} = N$

will become $\frac{4}{5} \times \frac{10}{1} = N$

Step 3. Multiply the numerators.

$$\frac{4}{5} \text{ x } \frac{10}{1} = \frac{40}{\square}$$

Step 4. Multiply the denominators.

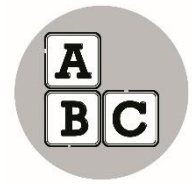
$$\frac{4}{5} \text{ x } \frac{10}{1} = \frac{\square}{5}$$

So, $\frac{4}{5} \text{ x } \frac{10}{1} = \frac{40}{5}$

Step 5. Express your answer in lowest term if possible. To simplify the answer, change the improper fraction to mixed fraction by dividing the numerator by its denominator.

$$\frac{4}{5} \text{ x } \frac{10}{1} = \frac{40}{5} \text{ or } 8$$

Therefore, there are 8 pieces of wood with equal length of $\frac{1}{3}$ m.



What's More

Find the quotient. Express your answer in lowest term. Write your answers on your answer sheet.

1. $\frac{3}{4} \div \frac{1}{4} =$ ☐
2. $\frac{5}{6} \div \frac{2}{4} =$ ☐
3. $\frac{3}{8} \div \frac{1}{2} =$ ☐
4. $\frac{4}{9} \div \frac{3}{4} =$ ☐
5. $\frac{5}{12} \div \frac{1}{5} =$ ☐

What I Have Learned

In dividing fraction by another fraction:
1. get the reciprocal of the divisor;
2. multiply the dividend to the reciprocal of the divisor;
3. multiply the numerators;
4. multiply the denominators; and,
5. express the answer to the lowest term if possible.

To simplify the answer, change the improper fraction to mixed fraction by dividing the numerator by its denominator.

What I Can Do

Solve for the quotient. Express your answer to the lowest term. Write your answers on your answer sheet.

1. $\frac{1}{5} \div \frac{3}{6} = \frac{1}{5} \text{ x } \frac{6}{3} = \frac{6}{15}$ or $\frac{\square}{\square}$

2. $\frac{2}{4} \div \frac{3}{7} = \frac{2}{4} \text{ x } \frac{7}{3} = \frac{14}{12}$ or $1\frac{\square}{\square}$ or $1\frac{\square}{\square}$

3. $\frac{1}{2} \div \frac{2}{6} = \frac{1}{2} \text{ x } \frac{6}{2} = \frac{6}{4}$ or $\square\frac{\square}{\square}$ or $\square\frac{\square}{\square}$

4. $\frac{1}{5} \div \frac{2}{3} = \frac{1}{5} \text{ x } \frac{3}{2} = \frac{\square}{\square}$

5. $\frac{3}{8} \div \frac{2}{5} = \frac{3}{8} \text{ x } \frac{5}{2} = \frac{\square}{\square}$

B. Solve the following problems. Show your solution and answers on your answer sheet.

6. The product of two simple fractions is $\frac{12}{35}$. If one of the fractions is $\frac{3}{7}$, what is the other one?

7. Carla bought $\frac{3}{4}$ kilogram of fish in the market for ₱120. If each piece of fish weighs $\frac{1}{4}$ kilogram, how much does each one cost?

Assessment

Divide and express your answers in lowest term. Write your answer on your answers sheet.

1. $\frac{6}{9} \div \frac{2}{5} =$ ☐
2. $\frac{3}{8} \div \frac{6}{12} =$ ☐
3. $\frac{4}{10} \div \frac{3}{4} =$ ☐
4. $\frac{1}{9} \div \frac{8}{10} =$ ☐
5. $\frac{2}{12} \div \frac{3}{8} =$ ☐
6. $\frac{9}{14} \div \frac{1}{2} =$ ☐
7. $\frac{3}{4} \div \frac{3}{5} =$ ☐
8. $\frac{1}{8} \div \frac{2}{3} =$ ☐
9. $\frac{1}{3} \div \frac{1}{2} =$ ☐
10. $\frac{3}{15} \div \frac{2}{5} =$ ☐

Additional Activities

A. Find the missing number. Write your answers on your answer sheet.

1. $\frac{3}{5} \div \frac{2}{6} = \frac{3}{5} \times \frac{6}{2} = \frac{\square}{10}$ or $1\frac{8}{10}$ or $1\frac{4}{5}$
2. $\frac{2}{4} \div \frac{5}{7} = \frac{2}{4} \times \frac{7}{5} = \frac{14}{20}$ or $\frac{\square}{10}$
3. $\frac{3}{7} \div \frac{1}{4} = \frac{3}{7} \times \frac{4}{1} = \frac{\square}{7}$ or $1\frac{5}{7}$
4. $\frac{6}{8} \div \frac{2}{3} = \frac{6}{8} \times \frac{3}{2} = \frac{\square}{16}$ or $1\frac{2}{16}$ or $1\frac{1}{8}$
5. $\frac{5}{6} \div \frac{1}{2} = \frac{5}{6} \times \frac{2}{1} = \frac{10}{6}$ or $1\frac{4}{6}$ or $1\frac{\square}{3}$

B. Solve the following problems. Show your solution and answers on your answer sheet.

6. Jan has $\frac{3}{8}$ kilogram of pechay. If he will share $\frac{1}{8}$ kilogram to each of his friends, how many of his friends can receive the pechay?
7. Martha has $\frac{6}{7}$ meter of cloth to be made into handkerchiefs. If she uses $\frac{1}{7}$ meter for each handkerchief, how many handkerchiefs can she make?
8. The area of a cloth is $\frac{21}{32}$ square decimeters. If its length measures $\frac{7}{8}$ decimeters long, what is its width?
9. If you are going to increase the length of a $\frac{1}{3}$ meter string by $\frac{1}{2}$ meter, how many pieces of $\frac{1}{6}$ meter can you cut from it?
10. A $\frac{5}{6}$ decimeter long ribbon is reduced by $\frac{1}{6}$ decimeter, how many $\frac{1}{9}$ decimeter long ribbon can you cut from it?

Answer Key

What I Know	What's In	What's More
1. $1\frac{7}{8}$ 2. $2\frac{1}{4}$ 3. $\frac{4}{5}$ 4. $\frac{5}{12}$ 5. $\frac{20}{21}$ 6. $2\frac{2}{5}$ 7. $\frac{1}{4}$ 8. 2 9. $\frac{1}{2}$ 10. $1\frac{1}{14}$	A. 1. $\frac{4}{25}$ 2. $\frac{1}{3}$ 3. $\frac{8}{21}$ B. 4. $\frac{4}{3}$ 5. $\frac{5}{2}$ 6. $\frac{4}{1}$ 7. $\frac{12}{4}$ 8. $\frac{10}{3}$	1. 3 2. $1\frac{2}{3}$ 3. $\frac{3}{4}$ 4. $\frac{16}{27}$ 5. $2\frac{1}{12}$

What I Can Do	Assessment	Additional Activities
A. 1. $\frac{2}{5}$ 2. $1\frac{1}{6}$ 3. $1\frac{1}{2}$ 4. $\frac{3}{10}$ 5. $\frac{15}{16}$ B. **1.** $\frac{4}{5}$ 2. ₱40	1. $1\frac{2}{3}$ 2. $\frac{3}{4}$ 3. $\frac{8}{15}$ 4. $\frac{5}{36}$ 5. $\frac{4}{9}$ 6. $1\frac{2}{7}$ 7. $1\frac{1}{4}$ 8. $\frac{3}{16}$ 9. $\frac{2}{3}$ 10. $\frac{1}{2}$	A. 1. 18 2. 7 3. 12 4. 18 5. 2 B. 6. 3 friends 7. 6 handkerchiefs 8. $\frac{3}{4}$ decimeter 9. 5 pieces 10. 6 ribbons

What I Know

Divide and express your answers in lowest term. Write your answer on your answer sheet.

1. $2\frac{3}{4} \div 1\frac{2}{5} =$ ☐
2. $3\frac{3}{5} \div 2\frac{1}{2} =$ ☐
3. $5\frac{7}{10} \div 3\frac{1}{2} =$ ☐
4. $2\frac{6}{9} \div 1\frac{1}{9} =$ ☐
5. $4\frac{1}{10} \div 2\frac{1}{2} =$ ☐
6. $3\frac{3}{10} \div 2\frac{2}{3} =$ ☐
7. $3\frac{3}{10} \div 2\frac{1}{4} =$ ☐
8. $3\frac{1}{2} \div 1\frac{1}{4} =$ ☐
9. $2\frac{1}{3} \div 1\frac{4}{6} =$ ☐
10. $2\frac{3}{14} \div 1\frac{1}{5} =$ ☐

Lesson 2 Dividing Mixed Fractions

In this lesson the pupils understanding and skills in dividing fractions can be enhanced more. The process is still the same wherein you need to find the reciprocal of the divisor and apply the steps in multiplying fractions.

What's In

A. Give the product. Express your answer in lowest term. Write your answers on your answer sheet.

1. $2\frac{1}{5} \times \frac{4}{5} =$ ☐
2. $1\frac{2}{5} \times \frac{5}{6} =$ ☐
3. $\frac{4}{7} \times 1\frac{2}{3} =$ ☐

B. Give the reciprocal of the following fractions. Write your answers on your answer sheet.

4. $\frac{2}{9}$
5. $\frac{4}{7}$
6. $\frac{1}{8}$
7. $\frac{5}{16}$
8. $\frac{6}{8}$

What's New

Study this problem.

Ana will bake a cake for her mother's birthday. Each cake requires $2\frac{1}{2}$ cups of sugar. If she has $7\frac{5}{10}$ cups of sugar, how many cakes can she bake?

What is It

To get the answer, we can write the division equation as:

$7\frac{5}{10} \div 2\frac{1}{2} = N$

Dividend

Divisor

Step 1. First, convert the mixed fraction to improper fraction by multiplying the denominator of the mixed fraction to the whole number and add the numerator. Don't forget to copy the denominator of the mixed fraction.

$$7\frac{5}{10} = \frac{10(7)+5}{10}$$

$$7\frac{5}{10} = \frac{75}{10}$$

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

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

So, the equation $7\frac{5}{10} \div 2\frac{1}{2} = N$

will become $\frac{75}{10} \div \frac{5}{2} = N$

Step 2. Get the reciprocal of the divisor.

The reciprocal of the divisor $\frac{5}{2}$ is $\frac{2}{5}$.

Step 3. Multiply the dividend to the reciprocal of the divisor.

The equation $\frac{75}{10} \div \frac{5}{2} = N$

will become $\frac{75}{10} \times \frac{2}{5} = N$

Step 4. Multiply the numerators.

$$\frac{75}{10} \text{ x } \frac{2}{5} = \frac{150}{\square}$$

Step 5. Multiply the denominators.

$$\frac{75}{10} \text{ x } \frac{2}{5} = \frac{\square}{50}$$

So, $\frac{75}{10} \text{ x } \frac{2}{5} = \frac{150}{50}$

Step 6. Express the answer to the lowest term if possible. To simplify the answer, change the improper fraction to mixed fraction by dividing the numerator to its denominator.

$$\frac{75}{10} \text{ x } \frac{2}{5} = \frac{150}{50} \text{or } \frac{3}{1} \text{ or } 3$$

Therefore, Ana can bake 3 cakes.

What's More

Find the quotient. Express your answer in lowest term. Write your answers on your answer sheet.

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

What I Have Learned

In dividing mixed fractions:

1. First, rename the mixed fraction to improper fraction by multiplying the denominator of the fraction by the whole number, and then adding the product to the numerator. Don't forget to copy the denominator of the mixed fraction.

Example: $2\frac{3}{4} = \frac{4(2)+3}{4}$

$2\frac{3}{4} = \frac{11}{4}$

2. Get the reciprocal of the divisor.
3. Multiply the dividend by the reciprocal of the divisor.
4. Multiply the numerators.
5. Multiply the denominators.
6. Express the answer in lowest term if possible.

To simplify the answer, change the improper fraction to mixed fraction by dividing the numerator by its denominator.

What I Can Do

A. Divide the following fractions. Express your answer in lowest term. Write your answers on your answer sheet.

1. $2\frac{5}{6} \div 1\frac{3}{5} =$ ☐
2. $4\frac{1}{2} \div 2\frac{1}{4} =$ ☐
3. $3\frac{1}{2} \div 1\frac{4}{6} =$ ☐
4. $3\frac{2}{8} \div 2\frac{2}{5} =$ ☐
5. $2\frac{1}{4} \div 1\frac{1}{3} =$ ☐

B. Solve the following problems. Show your solution and answers on your answer sheet.

6. It took $6\frac{1}{4}$ hours for Daryl to finish taking his test. If the allotted time for each subject is $1\frac{1}{4}$ hour, how many subjects did he take?

7. Christian poured $10\frac{1}{2}$ liters of water in containers. If each container holds $1\frac{3}{4}$ liters, how many containers did he fill?

Assessment

Divide then express your answers in lowest term. Write your answers on your answer sheet.

1. $3\frac{1}{3} \div 1\frac{2}{5} =$ ☐
2. $4\frac{2}{3} \div 1\frac{3}{6} =$ ☐
3. $2\frac{1}{5} \div 1\frac{3}{4} =$ ☐
4. $3\frac{1}{9} \div 1\frac{8}{10} =$ ☐
5. $2\frac{2}{10} \div 1\frac{2}{8} =$ ☐
6. $3\frac{1}{3} \div 1\frac{1}{2} =$ ☐
7. $2\frac{3}{4} \div 1\frac{3}{5} =$ ☐
8. $2\frac{1}{8} \div 1\frac{2}{3} =$ ☐
9. $3\frac{1}{3} \div 2\frac{1}{2} =$ ☐
10. $2\frac{3}{10} \div 1\frac{2}{5} =$ ☐

Additional Activities

A. Solve for the missing number. Write your answer on your answer sheet.

1. $2\frac{3}{4} \div 1\frac{1}{4} = \frac{11}{4} \div \frac{5}{4} = \frac{11}{4} \times \frac{4}{5} = \frac{\square}{20}$ or $2\frac{4}{20}$ or $2\frac{1}{5}$
2. $2\frac{1}{4} \div 1\frac{1}{2} = \frac{9}{4} \div \frac{3}{2} = \frac{9}{4} \times \frac{2}{3} = \frac{\square}{12}$ or $1\frac{6}{12}$ or $1\frac{1}{2}$
3. $3\frac{1}{2} \div 1\frac{1}{4} = \frac{7}{2} \div \frac{5}{4} = \frac{7}{2} \times \frac{4}{5} = \frac{\square}{10}$ or $2\frac{8}{10}$ or $2\frac{4}{5}$
4. $2\frac{2}{5} \div 1\frac{3}{5} = \frac{12}{5} \div \frac{8}{5} = \frac{12}{5} \times \frac{5}{8} = \frac{\square}{40}$ or $1\frac{20}{40}$ or $1\frac{1}{2}$
5. $2\frac{2}{4} \div 1\frac{1}{9} = \frac{10}{4} \div \frac{10}{9} = \frac{10}{4} \times \frac{9}{10} = \frac{\square}{40}$ or $2\frac{10}{40}$ or $2\frac{1}{4}$

B. Solve the following problems. Show your solution and answers on your answer sheet.

6. Jenny has $11\frac{1}{5}$ meters of cloth. If she needs $1\frac{2}{5}$ meters to make a blouse. How many blouses can she make out of the cloth?
7. Patricia bought $7\frac{1}{2}$ meters of cloth for her curtain. She used $1\frac{1}{4}$ meters for each curtain. How many curtains did she sew?
8. Mr. Santos has $7\frac{1}{5}$ hectares of mango orchard. He wants to subdivide it into $1\frac{4}{5}$ hectares to be shared to his sons. Into how many parts can he divide his mango orchard?
9. During the COVID-19 pandemic new gasoline price scheme is given by Marilou's Gas Station to help our drivers. On their purchase, the first 4 liters cost ₱120.00, while the succeeding $1\frac{1}{2}$ liters would cost ₱10.00 more than the cost of a liter. If John bought $17\frac{1}{2}$ liters, how much should he pay?
10. Jose studied for $4\frac{1}{2}$ hours on Saturday and another $6\frac{1}{4}$ hours on Sunday. How many subjects did he study if he allotted $1\frac{1}{2}$ hours per subject on Saturday and $1\frac{1}{4}$ hours per subject on Sunday?

Answer Key

What I Know	What's In	What's More
1. $1\frac{27}{28}$	A.	1. $2\frac{1}{5}$
2. $1\frac{11}{25}$	1. $1\frac{19}{25}$	2. $2\frac{1}{3}$
3. $1\frac{22}{35}$	2. $1\frac{1}{6}$	3. $1\frac{7}{12}$
4. $2\frac{2}{5}$	3. $\frac{20}{21}$	4. $1\frac{11}{21}$
5. $1\frac{16}{25}$	B.	5. $2\frac{1}{12}$
6. $1\frac{19}{80}$	4. $\frac{9}{2}$	
7. $1\frac{7}{15}$	5. $\frac{7}{4}$	
8. $2\frac{4}{5}$	6. $\frac{8}{1}$	
9. $1\frac{2}{5}$	7. $\frac{16}{5}$	
10. $1\frac{71}{84}$	8. $\frac{8}{6}$	

What I Can Do

A.

1. $1\frac{37}{48}$
2. 2
3. $2\frac{1}{10}$
4. $1\frac{17}{48}$
5. $1\frac{11}{16}$

B.

6. 5 subjects
7. 6 containers

Assessment

1. $2\frac{8}{21}$
2. $3\frac{1}{9}$
3. $1\frac{9}{35}$
4. $1\frac{59}{81}$
5. $1\frac{19}{25}$
6. $2\frac{2}{9}$
7. $1\frac{23}{32}$
8. $1\frac{11}{40}$
9. $1\frac{1}{3}$
10. $1\frac{9}{14}$

Additional Activities

A.

1. 44
2. 18
3. 28
4. 60
5. 90

B.

6. 8 blouses
7. 6 curtains
8. 4 parts
9. ₱480
10. 8 subjects

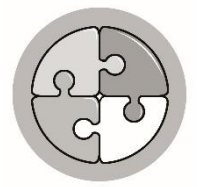
What I Know

Divide and express your answers in lowest term. Write your answers on your answer sheet.

1. $1\frac{2}{8} \div \frac{1}{5} =$ ☐
2. $2\frac{3}{8} \div \frac{1}{2} =$ ☐
3. $3\frac{2}{4} \div \frac{2}{3} =$ ☐
4. $1\frac{8}{9} \div \frac{1}{3} =$ ☐
5. $3\frac{2}{5} \div \frac{1}{2} =$ ☐
6. $1\frac{5}{15} \div \frac{2}{4} =$ ☐
7. $3\frac{2}{4} \div \frac{2}{4} =$ ☐
8. $2\frac{1}{2} \div \frac{3}{4} =$ ☐
9. $3\frac{4}{6} \div \frac{1}{3} =$ ☐
10. $2\frac{1}{3} \div \frac{1}{5} =$ ☐

Lesson 3 Dividing Simple Fractions and Mixed Fractions

The knowledge in multiplying fractions can be practiced more in this lesson. In dividing simple fractions and mixed fractions you need to look for the reciprocal of the divisor and then proceed to the rule in multiplying fractions.



What's In

A. Give the product. Express your answers in lowest term. Write your answers on your answer sheet.

1. $\frac{2}{6} \times \frac{6}{5} =$ ☐
2. $\frac{10}{8} \times \frac{1}{6} =$ ☐
3. $\frac{1}{7} \times \frac{3}{6} =$ ☐

B. Give the reciprocal of the following fractions. Write your answers on your answer sheet.

4. $\frac{5}{4}$
5. $\frac{3}{5}$
6. $\frac{3}{9}$
7. $\frac{10}{15}$
8. $\frac{3}{12}$

What's New

Study this problem.

Liza plans to make pillowcases. She bought $10\frac{1}{2}$ meters of cloth. She needs $\frac{1}{2}$ meter for each pillow case. How many pillowcases can she make?

What is It

To get the answer, we can write the division equation as:

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

Dividend

Divisor

Step 1. First, convert the mixed fraction to improper fraction by multiplying the denominator of the mixed fraction to the whole number and add the numerator. Don't forget to copy the denominator of the mixed fraction.

$$10\frac{1}{2} = \frac{2(10)+1}{2}$$

$$10\frac{1}{2} = \frac{21}{2}$$

So, the equation $10\frac{1}{2} \div \frac{1}{2} = N$

will become $\frac{21}{2} \div \frac{1}{2} = N$

Step 2. Get the reciprocal of the divisor.

The reciprocal of the divisor $\frac{1}{2}$ is $\frac{2}{1}$.

Step 3. Multiply the dividend to the reciprocal of the divisor.

The equation $\frac{21}{2} \div \frac{1}{2} = N$

will become $\frac{21}{2} \times \frac{2}{1} = N$

Step 4. Multiply the numerators.

$$\frac{21}{2} \text{ x } \frac{2}{1} = \frac{42}{\square}$$

Step 5. Multiply the denominators.

$$\frac{21}{2} \text{ x } \frac{2}{1} = \frac{\square}{2}$$

So, $\frac{21}{2}$ x $\frac{2}{1} = \frac{42}{2}$

Step 6. Express the answer in lowest term if possible. To simplify the answer, change the improper fraction to mixed fraction by dividing the numerator to its denominator.

$\frac{21}{2}$ x $\frac{2}{1} = \frac{42}{2}$ or $\frac{21}{1}$ or 21

Therefore, Liza can make 21 pillowcases.

Now that you are already familiar of the steps on how to divide fractions, you can now move on in studying problem solving involving division of fractions.

Read the problem and study the solution below.

An $8\frac{3}{4}$ -meter bamboo pole is to be cut into pieces $1\frac{3}{4}$ meters long each. How many smaller cuts of the same length can you get from it?

Consider the following steps in solving the problem:

1. Understand

   - What is asked in the problem?
     Answer: The number of smaller cuts of bamboo poles we can get from an $8\frac{3}{4}$ -meter bamboo pole.
   - What facts are needed to solve the problem?
     Answer: $8\frac{3}{4}$ meters → length of the bamboo pole
     $1\frac{3}{4}$ meters → length of each smaller cut

2. Plan
   - What operation/s is/are needed to solve the problem?
     Answer: Division
   - What is the number sentence?
     Answer: $8\frac{3}{4} \div 1\frac{3}{4} = N$
3. Solve

   $8\frac{3}{4} \div 1\frac{3}{4} = N$

   $\frac{35}{4} \div \frac{7}{4} = N$ $\frac{35}{4} \times \frac{4}{7} = \frac{140}{28}$ or 5

   Therefore, we can cut 5 pieces of $1\frac{3}{4}$ - meter each from an $8\frac{3}{4}$ meter long bamboo pole.

4. Check

   $1\frac{3}{4} \times 5 = N$ $\frac{7}{4} \times \frac{5}{1} = \frac{35}{4}$ or $8\frac{3}{4}$

   Here is another problem that will challenge you more.

The quotient of a mixed number and a simple fraction is a whole number and their sum is $2\frac{1}{4}$. The numerator of the divisor is the same with the numerator of the dividend when changed to improper fraction. What are the two fractions in their simplest form?

To solve for this, we are going to consider the following steps:

1. Understand
   - What is asked in the problem?
     Answer: The two given fractions
   - What facts are needed to solve the problem?
     Answer: *2* $\frac{1}{4}$ → *sum of the mixed and simple fraction*
     whole number → *quotient of the two fractions*
2. Plan
   - Strategy to solve the problem
     Answer: *Guess and Check will help you solve the problem.*

3. Solve

First, let us consider the condition *" the sum of the mixed number and simple fraction is* $2\frac{1}{4}$*"*

Since the sum of the two fractions is $2\frac{1}{4}$, and they are both in simplest form, we will try to look for a mixed number and a simple fraction in simplest form that adds up to $2\frac{1}{4}$.

Trial 1: $2\frac{1}{4} + \frac{2}{4} = 2\frac{3}{4}$

Trial 2: $1\frac{1}{4} + \frac{3}{4} = 1\frac{4}{4}$ or 2

These two do not satisfy the first condition since their sum is not $2\frac{1}{4}$.

Trial 3: $1\frac{3}{4} + \frac{1}{2} = 1\frac{3}{4} + \frac{2}{4} = 1\frac{5}{4}$ or $2\frac{1}{4}$

Trial 4: $1\frac{1}{2} + \frac{3}{4} = 1\frac{2}{4} + \frac{3}{4} = 1\frac{5}{4}$ or $2\frac{1}{4}$

Trial 3 and Trial 4 satisfy the first condition since their sum is $2\frac{1}{4}$.

So, we will consider only Trial 3 ($1\frac{3}{4}$ and $\frac{1}{2}$) and Trial 4 ($1\frac{1}{2}$ and $\frac{3}{4}$) as possible answers because only these two satisfy the condition.

Next, consider the condition *"the numerator in the divisor is the same with the numerator in the dividend when changed to improper fraction"*

Let's try our 3rd Trial ($1\frac{3}{4}$ and $\frac{1}{2}$)

$1\frac{3}{4} \div \frac{1}{2} = \frac{7}{4} \div \frac{1}{2}$

This does not satisfy the condition because the numerators are different.

4th Trial ($1\frac{1}{2}$ and $\frac{3}{4}$)

$1\frac{1}{2} \div \frac{3}{4} = \frac{3}{2} \div \frac{3}{4}$

This satisfies the condition because the numerators are the same.

In this case, only Trial 4 satisfies the condition. So, we will use only our 4th trial to test whether it also satisfies the last condition, *"their quotient is a whole number."*

So we are going to divide $1\frac{1}{2}$ by $\frac{3}{4}$.

$1\frac{1}{2} \div \frac{3}{4} = \frac{3}{2} \div \frac{3}{4}$

$\frac{3}{2} \times \frac{4}{3} = \frac{12}{6}$ or (2)

The quotient is a whole number. Thus, it satisfies the last condition.

Therefore, the two fractions are $1\frac{1}{2}$ and $\frac{3}{4}$.

Can you think of other pair of fractions that satisfy the conditions given? Give it a try!

4. Check

$1\frac{1}{2} \div \frac{3}{4} = \frac{3}{2} \div \frac{3}{4}$

$\frac{3}{2} \times \frac{4}{3} = \frac{12}{6}$ or 2 → the quotient is a whole number

$1\frac{1}{2} + \frac{3}{4} = 1\frac{2}{4} + \frac{3}{4} = 1\frac{5}{4}$ or $2\frac{1}{4}$ → the sum is $2\frac{1}{4}$

The mixed number and the simple fraction are in simplest form.

What's More

Solve for the quotient. Express you answer in lowest term. Write your answers on your answer sheet.

1. $1\frac{3}{4} \div \frac{2}{4} =$ ☐
2. $2\frac{1}{4} \div \frac{2}{3} =$ ☐
3. $1\frac{4}{9} \div \frac{1}{2} =$ ☐
4. $1\frac{2}{4} \div \frac{1}{4} =$ ☐
5. $1\frac{3}{8} \div \frac{2}{3} =$ ☐

B. Solve the following problems. Show your solution and answers in your answer sheet.

Two simple fractions have the product of $\frac{3}{10}$. When the smaller fraction is divided by the bigger fraction, the quotient is $\frac{5}{6}$. What are the two fractions in simplest form?

What I Have Learned

In dividing simple and mixed fraction;

1. First, rename the mixed fraction to improper fraction by multiplying the denominator of the fraction by the whole nmuber, and then adding the product to the numerator. Don't forget to copy the denominator of the mixed fraction.

$$4\frac{2}{3} = \frac{3(4)+2}{3}$$

$$4\frac{2}{3} = \frac{14}{3}$$

2. Get the reciprocal of the divisor.
3. Multiply the dividend by the reciprocal of the divisor.
4. Multiply the numerators.
5. Multiply the denominators.
6. Express the answer to the lowest term if possible.

To simplify the answer, change the improper fraction to mixed fraction by dividing the numerator by its denominator.

What I Can Do

A. Find the quotient. Express your answer in lowest term. Write your answers on your answer sheet.

1. $2\frac{1}{3} \div \frac{3}{7} =$ ☐
2. $3\frac{2}{5} \div \frac{1}{2} =$ ☐
3. $1\frac{1}{2} \div \frac{1}{6} =$ ☐
4. $1\frac{1}{8} \div \frac{1}{3} =$ ☐
5. $2\frac{2}{4} \div \frac{1}{3} =$ ☐

B. Solve the following problems. Show your solution and answers in your answer sheet.

6. Carmela drinks $\frac{1}{3}$ liter of milk every day. How many days can she finish drinking $2\frac{1}{3}$ liters of milk?

7. Joshua thinks of a simple fraction in simplest form that when he subtracts from $1\frac{1}{5}$ will give him the same fraction as the difference. Then, when he divides the bigger fraction by the smaller fractions, the answer is 2. What is the fraction?

Assessment

A. Divide and express your answer in lowest term. Write your answers on your answer sheet.

1. $1\frac{6}{7} \div \frac{2}{3} =$ ☐
2. $2\frac{3}{5} \div \frac{1}{3} =$ ☐
3. $1\frac{4}{8} \div \frac{3}{4} =$ ☐
4. $1\frac{1}{6} \div \frac{8}{10} =$ ☐
5. $1\frac{2}{7} \div \frac{3}{8} =$ ☐
6. $2\frac{9}{10} \div \frac{1}{2} =$ ☐
7. $2\frac{3}{6} \div \frac{3}{5} =$ ☐
8. $1\frac{1}{10} \div \frac{2}{3} =$ ☐
9. $1\frac{1}{8} \div \frac{1}{2} =$ ☐
10. $1\frac{3}{4} \div \frac{2}{5} =$ ☐

B. Solve the problem below. Show your solution and answer on your answer sheet.

Three simple fractions which are similar fractions have consecutive numerators. When the quotient of the first and second fraction is divided by the third fraction, it will give you $\frac{2}{3}$. If the numerators and denominators of these fractions are not more than 5, what are the three fractions arranged in ascending order (fractions not necessarily in simplest form)?

Additional Activities

A. Solve for the missing number. Write your answer on your answer sheet.

1. $1\frac{1}{4} \div \frac{1}{6} = \frac{5}{4} \div \frac{1}{6} = \quad \frac{5}{4} \times \frac{\square}{1} = \frac{30}{4}$ or $7\frac{2}{4}$ or $7\frac{1}{2}$

2. $1\frac{2}{3} \div \frac{3}{7} = \frac{5}{3} \div \frac{3}{7} = \quad \frac{5}{3} \times \frac{7}{\square} = \frac{35}{9}$ or $3\frac{8}{9}$

3. $2\frac{1}{4} \div \frac{1}{3} = \frac{7}{4} \div \frac{1}{3} = \quad \frac{7}{4} \times \frac{3}{1} = \frac{\square}{4}$ or $5\frac{1}{4}$

4. $3\frac{1}{3} \div \frac{2}{3} = \frac{10}{3} \div \frac{2}{3} = \frac{10}{3} \times \frac{3}{2} = \frac{\square}{6}$ or $\frac{5}{1}$ or 5

5. $1\frac{3}{9} \div \frac{1}{2} = \frac{12}{9} \div \frac{1}{2} = \quad \frac{12}{9} \times \frac{\square}{1} = \frac{24}{9}$ or $2\frac{6}{9}$ or $2\frac{2}{3}$

B. Solve the following problems. Show your solution and answers on your answer sheet.

6. A piece of string is $1\frac{4}{5}$ meters long. How many $\frac{3}{10}$ meter-long strings can you cut from it?

7. Jeremy repacked $7\frac{1}{5}$ kilograms of salt into smaller packs weighing $\frac{3}{5}$ kilogram each. How many smaller packs can he make?

8. A small basin holds $2\frac{1}{9}$ liters of water to its brim. If each glass contains $\frac{1}{9}$ liters of water, how many glasses of water are needed to fill the basin to its brim?

9. Ron has $4\frac{2}{3}$ liters of oil. He kept $1\frac{1}{4}$ liters and divided the rest into parts of $\frac{3}{4}$ liter each. How many parts did he make?

10. When two similar simple fractions with denominators less than 10 are multiplied, their product is $\frac{1}{16}$ in simplest from. When you divide the smaller fraction by the bigger fraction, the quotient is twice the smaller fraction. What are the two similar fractions?

Answer Key

What I Know

1. $6\frac{1}{4}$
2. $4\frac{3}{4}$
3. $5\frac{1}{4}$
4. $5\frac{2}{3}$
5. $6\frac{4}{5}$
6. $2\frac{2}{3}$
7. 7
8. $3\frac{1}{3}$
9. 11
10. $11\frac{2}{3}$

What's In

A.

1. $\frac{2}{5}$
2. $\frac{5}{24}$
3. $\frac{1}{14}$

B.

4. $\frac{4}{5}$
5. $\frac{5}{3}$
6. $\frac{9}{3}$
7. $\frac{15}{10}$
8. $\frac{12}{3}$

What's More

A.

1. $3\frac{1}{2}$
2. $3\frac{3}{8}$
3. $2\frac{8}{9}$
4. 6
5. $2\frac{1}{16}$

B.

$\frac{3}{5}$ and $\frac{1}{2}$

What I Can Do	Assessment	Additional Activities
A. 1. $5\frac{4}{9}$ 2. $6\frac{4}{5}$ 3. 9 4. $3\frac{3}{8}$ 5. $7\frac{1}{2}$ B. 6. 7 days 7. $\frac{3}{5}$	A. 1. $2\frac{11}{14}$ 2. $7\frac{4}{5}$ 3. 2 4. $1\frac{11}{24}$ 5. $3\frac{3}{7}$ 6. $5\frac{4}{5}$ 7. $4\frac{1}{6}$ 8. $1\frac{13}{20}$ 9. $2\frac{1}{4}$ 10. $4\frac{3}{8}$ B. $\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$	A 1. 6 2. 3 3. 21 4. 30 5. 2 B. 6. 6 strings 7. 12 parts 8. 19 glasses 9. $4\frac{5}{9}$ 10. $\frac{1}{8}$ and $\frac{4}{8}$

Reference:

- Most Essential Learning Competencies (MELC) in Mathematics 6

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