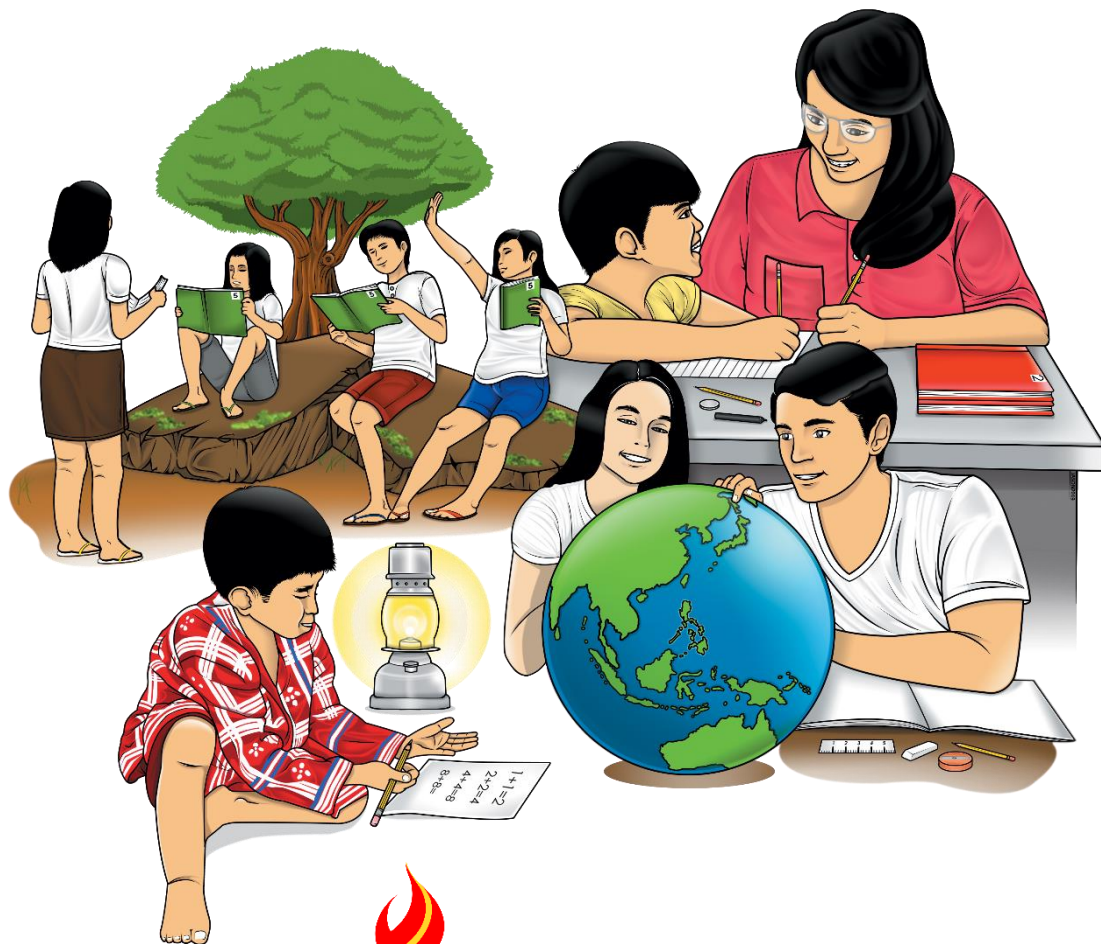


Mathematics

Quarter 1 – Module 3: Multiplying Simple Fractions and Mixed Fractions



Mathematics – Grade 6
Alternative Delivery Mode
Quarter 1 – Module 3: Multiplying Simple Fractions and Mixed Fractions
First Edition, 2020

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Mathematics

Quarter 1 – Module 3: Multiplying Simple Fractions and Mixed Fractions

Introductory Message

For the facilitator:

Welcome to the Mathematics 6 Alternative Delivery Mode (ADM) Module on Multiplying 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 Multiplying 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 multiply 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 – Multiplying Simple Fractions
- Lesson 2 – Multiplying Mixed Fractions
- Lesson 3 – Multiplying Simple Fractions and Mixed Fractions

After going through this module, you are expected to:

1. multiply simple fractions; **(M6NS-Ib-90.2)**
2. multiply mixed fractions; **(M6NS-Ib-90.2)**
3. multiple simple fractions and mixed fractions; **(M6NS-Ib-90.2)** and
4. solve routine or non-routine problems involving multiplication without or with addition or subtraction of fractions and mixed fractions using appropriate problem-solving strategies and tools. **(M6NS-Ib-92.2)**



What I Know

Multiply the following fractions. Write the answers on your answer sheet.

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

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

3. $\frac{9}{10} \times \frac{1}{4} =$

4. $\frac{2}{9} \times \frac{5}{7} =$

5. $\frac{6}{11} \times \frac{5}{12} =$

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

7. $\frac{1}{11} \times \frac{10}{12} =$

8. $\frac{4}{9} \times \frac{5}{3} =$

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

10. $\frac{2}{4} \times \frac{10}{11} =$

Lesson**1****Multiplying Simple Fractions**

You have learned how to subtract simple fractions in the past lesson. Now, you will learn how to multiply simple fractions.

***What's In***

Reduce the following fractions to its lowest terms. Write the answers on your answer sheet.

1) $\frac{8}{10}$	<input type="text"/>
2) $\frac{7}{14}$	<input type="text"/>
3) $\frac{4}{20}$	<input type="text"/>
4) $\frac{5}{10}$	<input type="text"/>
5) $\frac{12}{18}$	<input type="text"/>



What's New

Look at the problem situation below.

Romeo grows flowering plants on $\frac{3}{4}$ of his plot of land. One-fifth of the planted area is for the roses. What fraction of his plot of land is used for growing roses?

Solution: To find the fraction of Romeo's plot of land used for growing roses, we multiply $\frac{1}{5}$ by $\frac{3}{4}$.

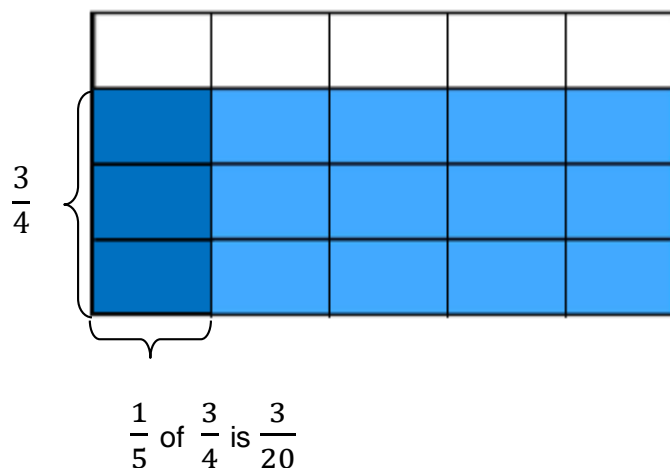


What is It

Find: $\frac{1}{5} \times \frac{3}{4} = N$

Method 1

We can represent $\frac{1}{5}$ of $\frac{3}{4}$ in a diagram below.



Method 2

Multiply $\frac{1}{5}$ by $\frac{3}{4}$.

Solution: Multiply both the numerators and both the denominators.

Express the answer in simplest form if necessary.

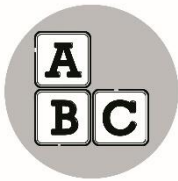
$$\frac{1}{5} \times \frac{3}{4} = \frac{1 \times 3}{5 \times 4} = \frac{3}{20}$$

Therefore, Romeo's plot of land used for growing roses is $\frac{3}{20}$.

Here are some examples for you to study.

$$\frac{1}{3} \times \frac{2}{3} = \frac{1 \times 2}{3 \times 3} = \frac{2}{9}$$

$$\frac{3}{8} \times \frac{2}{3} = \frac{3 \times 2}{8 \times 3} = \frac{6}{24} \text{ or } \frac{1}{4}$$



What's More

Multiply the following fractions. Write the answers on your answer sheet.

1) $\frac{7}{10} \times \frac{4}{6} = \frac{\square}{60} \text{ or } \frac{\square}{\square}$

4) $\frac{3}{6} \times \frac{8}{9} = \frac{\square}{54} \text{ or } \frac{\square}{9}$

2) $\frac{2}{3} \times \frac{4}{5} = \frac{\square}{15}$

5) $\frac{8}{9} \times \frac{1}{2} = \frac{8}{\square} \text{ or } \frac{\square}{9}$

3) $\frac{2}{8} \times \frac{1}{3} = \frac{2}{\square} \text{ or } \frac{\square}{\square}$



What I Have Learned

To multiply a fraction by another fraction,

- multiply both the numerators and both the denominators.
- Express the answer in simplest form or lowest term, if needed.



What I Can Do

A. Multiply the following fractions. Write the answers on your answer sheet.

1) $\frac{2}{3} \times \frac{5}{6} =$

4) $\frac{5}{9} \times \frac{1}{6} =$

2) $\frac{3}{5} \times \frac{1}{3} =$

5) $\frac{3}{8} \times \frac{4}{5} =$

3) $\frac{4}{7} \times \frac{1}{4} =$

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

6) In Mrs. Reyes classroom $\frac{7}{9}$ of her class are girls. Among them $\frac{2}{3}$ of the girls joined the Girl Scout camping. What part of the class who joined the camping are girls?

7). A pack of sugar weighs $\frac{3}{4}$ kg. Jessa used $\frac{1}{4}$ of it for cooking *puto*. How many kilograms of sugar did she use?



Assessment

Multiply the following fractions. Write the answers on your answer sheet.

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

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

3. $\frac{5}{7} \times \frac{1}{3} =$

4. $\frac{8}{10} \times \frac{4}{7} =$

5. $\frac{2}{5} \times \frac{1}{4} =$

6. $\frac{2}{7} \times \frac{7}{9} =$

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

8. $\frac{3}{9} \times \frac{1}{11} =$

9. $\frac{4}{5} \times \frac{3}{8} =$

10. $\frac{8}{12} \times \frac{1}{5} =$



Additional Activities

A. Multiply. Express your answer in simplest form or lowest term, if needed. Write the answers on your answer sheet.

$$1) \frac{3}{4} \times \frac{3}{6} = \boxed{}$$

$$2) \frac{5}{7} \times \frac{3}{8} = \boxed{}$$

$$3) \frac{7}{9} \times \frac{2}{10} = \boxed{}$$

$$4) \frac{4}{5} \times \frac{4}{7} = \boxed{}$$

$$5) \frac{2}{6} \times \frac{2}{3} = \boxed{}$$

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

6) Trixie had $\frac{8}{14}$ kg of flour. She used $\frac{1}{2}$ of it in making bread. How much flour did she use to make the bread?

7) John bought $\frac{3}{4}$ kg of sugar. He used $\frac{1}{4}$ of it in making calamansi juice. How much sugar did he use?

8) Adrian spent $\frac{5}{8}$ of his weekly allowance. Three-fifths of the amount was spent for food. What fraction of his weekly allowance did he spend for food?

9) Alex had $\frac{5}{6}$ liter of white paint. He used $\frac{1}{8}$ of it to paint the wall and $\frac{2}{5}$ of the remaining to paint the fence. What part of the paint was left?

10) Diego has $\frac{3}{4}$ liter of gasoline. He consumed $\frac{1}{5}$ of it in going to the market and $\frac{1}{6}$ of the remaining gasoline in going to the church. How many liters of gasoline did he consume?



Answer Key

<p>What I Know</p> <p>1. $\frac{10}{21}$</p> <p>2. $\frac{1}{4}$</p> <p>3. $\frac{9}{40}$</p> <p>4. $\frac{10}{63}$</p> <p>5. $\frac{5}{22}$</p> <p>6. $\frac{8}{35}$</p> <p>7. $\frac{5}{66}$</p> <p>8. $\frac{20}{27}$</p> <p>9. $\frac{4}{15}$</p> <p>10. $\frac{5}{11}$</p>	<p>What's In</p> <p>1. $\frac{5}{4}$</p> <p>2. $\frac{1}{2}$</p> <p>3. $\frac{1}{5}$</p> <p>4. $\frac{1}{2}$</p> <p>5. $\frac{2}{3}$</p>	<p>What's More</p> <p>1) $\frac{7}{10} \times \frac{6}{4} = \frac{60}{28}$ or $\frac{15}{7}$</p> <p>2) $\frac{3}{2} \times \frac{5}{4} = \frac{15}{8}$</p> <p>3) $\frac{2}{8} \times \frac{1}{3} = \frac{24}{12}$ or $\frac{1}{12}$</p> <p>4) $\frac{3}{8} \times \frac{6}{9} = \frac{54}{24}$ or $\frac{9}{4}$</p> <p>5) $\frac{9}{8} \times \frac{2}{1} = \frac{18}{8}$ or $\frac{9}{4}$</p>
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<p>What I Can Do</p> <p>A.</p> <p>1. $\frac{9}{5}$</p> <p>2. $\frac{1}{5}$</p> <p>3. $\frac{45}{7}$</p> <p>4. $\frac{54}{5}$</p> <p>5. $\frac{3}{10}$</p> <p>B.</p> <p>6. $\frac{14}{27}$</p> <p>7. $\frac{16}{3}$ kg</p>	<p>Assessment</p> <p>1. $\frac{1}{24}$</p> <p>2. $\frac{9}{1}$</p> <p>3. $\frac{5}{21}$</p> <p>4. $\frac{16}{35}$</p> <p>5. $\frac{1}{10}$</p> <p>6. $\frac{9}{2}$</p> <p>7. $\frac{5}{2}$</p> <p>8. $\frac{1}{33}$</p> <p>9. $\frac{10}{3}$</p> <p>10. $\frac{2}{15}$</p>	<p>Additional Activities</p> <p>A.</p> <p>1. $\frac{8}{3}$</p> <p>2. $\frac{56}{15}$</p> <p>3. $\frac{45}{7}$</p> <p>4. $\frac{16}{35}$</p> <p>5. $\frac{2}{9}$</p> <p>B.</p> <p>6. $\frac{7}{2}$</p> <p>7. $\frac{16}{3}$</p> <p>8. $\frac{8}{3}$</p> <p>9. $\frac{16}{7}$</p> <p>10. $\frac{1}{4}$</p>
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What I Know

Change the following mixed fractions to improper fractions then multiply. Reduce your answer in simplest form or lowest term, if needed. Write your answers on your answer sheet.

1. $1\frac{3}{5} \times 3\frac{1}{3} =$

2. $3\frac{1}{2} \times 2\frac{2}{5} =$

3. $3\frac{3}{5} \times 2\frac{1}{5} =$

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

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

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

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

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

9. $3\frac{5}{6} \times 3\frac{2}{3} =$

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

Lesson**2****Multiplying Mixed Fractions**

This lesson focuses on how to multiply mixed fractions. The process involves changing mixed form to improper fraction, multiplying fractions and reducing fractions to lowest term.

***What's In***

Give the product. Reduce the answer in simplest form or lowest term, if needed. Write your answers on your answer sheet.

1. $\frac{4}{5} \times 1\frac{4}{5} = \boxed{}$

2. $\frac{1}{5} \times 1\frac{5}{6} = \boxed{}$

3. $\frac{4}{7} \times 2\frac{2}{3} = \boxed{}$

4. $\frac{2}{9} \times 2\frac{1}{3} = \boxed{}$

5. $\frac{3}{5} \times 9\frac{1}{2} = \boxed{}$

***What's New***

Study this problem.

A mango float recipe uses $3\frac{1}{2}$ cups of milk. If you are going to prepare $1\frac{1}{2}$ times of the recipe, how much milk will you need?

Find $1\frac{1}{2}$ of $3\frac{1}{2}$.



What is It

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

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

Step 1. First, change the mixed fraction to improper fraction by multiplying the denominator by the whole number. Then add the product to the numerator to get the new numerator. Copy the denominator of the mixed fraction.

$1\frac{1}{2} = \frac{2(1)+1}{2}$ $1\frac{1}{2} = \frac{3}{2}$	$3\frac{1}{2} = \frac{2(3)+1}{2}$ $3\frac{1}{2} = \frac{7}{2}$
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The equation $1\frac{1}{2} \times 3\frac{1}{2} = N$ will become, $\frac{3}{2} \times \frac{7}{2} = N$

Step 2. Multiply the numerators.

$$\frac{3}{2} \times \frac{7}{2} = \frac{3(7)}{2} = \frac{21}{2}$$

Step 3. Multiply the denominators.

$$\frac{3}{2} \times \frac{7}{2} = \frac{21}{2(2)} = \frac{21}{4}$$

$$\text{So, } \frac{3}{2} \times \frac{7}{2} = \frac{21}{4}$$

Step 4. Express your answer to simplest form or lowest term, if needed.

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

$$\frac{3}{2} \times \frac{7}{2} = \frac{21}{4} \text{ or } 5\frac{1}{4}$$

$$\begin{array}{r} 4 \overline{) 21} \\ \underline{-20} \\ 1 \end{array}$$

Thus, you need $5\frac{1}{4}$ cups of milk for the recipe.



What's More

Complete the process. Write your answers on your answer sheet.

1. $2\frac{3}{4} \times 1\frac{1}{4} = \frac{11}{4} \times \frac{5}{4} = \boxed{}$

4. $1\frac{1}{9} \times 1\frac{2}{4} = \frac{10}{9} \times \frac{6}{4} = \boxed{}$

2. $2\frac{1}{3} \times 2\frac{2}{4} = \frac{7}{3} \times \frac{10}{4} = \boxed{}$

5. $2\frac{1}{2} \times 1\frac{2}{6} = \frac{5}{2} \times \frac{8}{6} = \boxed{}$

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



What I Have Learned

In multiplying mixed fractions,

- First, change the mixed fraction to improper fraction by multiplying the denominator by the whole number. Then add the product to the numerator to get the new numerator. Copy the denominator of the mixed fraction.
- Multiply the numerators.
- Multiply the denominators.
- Express the answer to the simplest form or lowest term, if needed. To simplify the answer, change the improper fraction to mixed fraction by dividing the numerator by its denominator.



What I Can Do

A. Multiply the fractions. Express the answer to the simplest form or lowest term, if needed. Write your answers on your answer sheet.

1. $2\frac{1}{3} \times 2\frac{3}{5} = \boxed{}$

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

2. $2\frac{2}{3} \times 1\frac{1}{4} = \boxed{}$

5. $1\frac{1}{4} \times 5\frac{1}{3} = \boxed{}$

3. $3\frac{1}{2} \times 1\frac{4}{6} = \boxed{}$

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

6. Alice needs $2\frac{3}{4}$ cups of milk for her puto recipe. How many cups are needed for $1\frac{1}{2}$ of the recipe?

7. Joey works in his farm on Monday for $2\frac{1}{5}$ hours. On Tuesday, he spent $1\frac{3}{4}$ of his time on Monday. How many hours did he work on Tuesday?



Assessment

Convert the following mixed fractions to improper fractions, then multiply. Reduce the answer to the simplest form or lowest term, if needed. Write your answers on your answer sheet.

1. $1\frac{1}{5} \times 2\frac{1}{5} = \boxed{}$

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

2. $2\frac{3}{7} \times 1\frac{1}{8} = \boxed{}$

7. $1\frac{2}{5} \times 4\frac{2}{4} = \boxed{}$

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

8. $1\frac{5}{7} \times 2\frac{2}{4} = \boxed{}$

4. $1\frac{1}{8} \times 1\frac{1}{5} = \boxed{}$

9. $1\frac{3}{5} \times 2\frac{5}{6} = \boxed{}$

5. $1\frac{2}{5} \times 1\frac{1}{4} = \boxed{}$

10. $1\frac{1}{9} \times 2\frac{3}{6} = \boxed{}$



Additional Activities

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

1. $1\frac{3}{9} \times 1\frac{2}{3} = \frac{12}{9} \times \frac{5}{3} = \frac{\square}{27}$ or $2\frac{2}{9}$

2. $1\frac{1}{2} \times 1\frac{2}{3} = \frac{3}{2} \times \frac{\square}{3} = \frac{15}{6}$ or $2\frac{3}{6}$ or $2\frac{1}{2}$

3. $2\frac{3}{5} \times 1\frac{1}{3} = \frac{13}{5} \times \frac{4}{3} = \frac{\square}{15}$ or $3\frac{7}{15}$

4. $2\frac{3}{4} \times 1\frac{1}{4} = \frac{11}{4} \times \frac{5}{4} = \frac{\square}{16}$ or $3\frac{7}{16}$

5. $1\frac{2}{5} \times 1\frac{2}{4} = \frac{7}{5} \times \frac{6}{4} = \frac{42}{20}$ or $2\frac{\square}{20}$ or $2\frac{1}{10}$

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

6. Ana spent $3\frac{1}{2}$ hour doing household chores. She spent $1\frac{1}{2}$ of it washing clothes. How much time did she spend in washing clothes?

7. Nina's garden is $4\frac{2}{3}$ feet long and $1\frac{1}{8}$ feet wide. What is the area of the garden?

8. Joshua consumes a liter of gasoline in traveling $5\frac{1}{3}$ kilometers. How far can he travel with $4\frac{1}{4}$ liters of gasoline?

9. A pack of all purpose flour weighs $4\frac{1}{2}$ kilograms. Grace used $1\frac{1}{4}$ packs of flour to bake a cake and $1\frac{2}{3}$ packs of flour for bread. How many kilograms of flour did Grace use?

10. Maria bought a roll of cloth $4\frac{1}{2}$ meters. She used $1\frac{2}{5}$ rolls of the cloth to sew pillow cases. How many meters of cloth did she use?



Answer Key

<p>What I Know</p> $1. 5\frac{1}{3}$ $2. 8\frac{5}{2}$ $3. 7\frac{23}{25}$ $4. 6$ $5. 7\frac{1}{5}$ $6. 12\frac{13}{20}$ $7. 12\frac{4}{3}$ $8. 11\frac{3}{2}$ $9. 14\frac{1}{18}$ $10. 6\frac{18}{35}$	<p>What's In</p> $1. 1\frac{11}{25}$ $2. \frac{11}{30}$ $3. 1\frac{11}{21}$ $4. \frac{14}{27}$ $5. 5\frac{10}{7}$	<p>What's More</p> $1. 3\frac{16}{7}$ $2. 5\frac{6}{5}$ $3. 1\frac{13}{15}$ $4. 1\frac{3}{2}$ $5. 3\frac{1}{3}$
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<p>What I Can Do</p> <p>A. $1.6\frac{1}{15}$ $2.3\frac{3}{1}$ $3.5\frac{6}{5}$ $4.1\frac{4}{3}$ $5.6\frac{3}{2}$ $6.4\frac{1}{8}$ $7.3\frac{17}{20}$</p> <p>B.</p>	<p>Assessment</p> <p>$1.2\frac{16}{25}$ $2.2\frac{56}{41}$ $3.4\frac{18}{5}$ $4.1\frac{20}{7}$ $5.1\frac{4}{3}$ $6.4\frac{9}{8}$ $7.6\frac{10}{3}$ $8.4\frac{7}{2}$ $9.4\frac{15}{8}$ $10.2\frac{9}{7}$</p>	<p>Additional Activities</p> <p>A. 1.60 2.5 3.52 4.55 5.2</p> <p>B. $6.5\frac{1}{4}$ $7.5\frac{1}{4}$sq. feet $8.22\frac{3}{2}$ $9.13\frac{1}{8}$ $10.6\frac{10}{3}$</p>
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What I Know

Solve for the product of the following fractions. Reduce the answer to the simplest form or lowest term, if needed. Write your answers on your answer sheet.

1. $\frac{4}{5} \times 1\frac{4}{5} =$

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

3. $\frac{3}{12} \times 2\frac{1}{5} =$

4. $\frac{3}{4} \times 1\frac{9}{10} =$

5. $\frac{2}{3} \times 3\frac{1}{3} =$

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

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

8. $\frac{2}{8} \times 5\frac{1}{6} =$

9. $\frac{1}{4} \times 2\frac{3}{4} =$

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

Lesson**3****Multiplying Simple Fractions and Mixed Fractions**

This lesson involves multiplying mixed fractions and simple fractions. Prior knowledge in renaming mixed form to improper fraction is very necessary. It will help you to practice your skills in multiplying and renaming fractions.

***What's In***

A. Change the following mixed fractions to improper fractions. Write your answers on your answer sheet.

1. $2\frac{5}{10}$

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

3. $3\frac{3}{12}$

B. Multiply the following fractions and reduce the answer to the simplest form or lowest term, if needed. Write your answers on your answer sheet.

4. $\frac{2}{3} \times \frac{3}{4} = \boxed{}$

5. $\frac{1}{3} \times \frac{3}{8} = \boxed{}$



What's New

Study this problem.

Janice bought $3\frac{1}{2}$ meters of cloth. She used $\frac{3}{5}$ of it to make a pair of pants. What part of the cloth did she use?

Find $\frac{3}{5}$ of $3\frac{1}{2}$.



What is It

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

$$\frac{3}{5} \times 3\frac{1}{2} = N$$

Step 1. First, change the mixed fraction to improper fraction by multiplying the denominator by the whole number. Then add the product to the numerator to get the new numerator. Copy the denominator of the mixed fraction.

$$3\frac{1}{2} = \frac{2(3)+1}{2} = \frac{7}{2}$$

The equation $\frac{3}{5} \times 3\frac{1}{2} = N$ will become, $\frac{3}{5} \times \frac{7}{2} = N$

Step 2. Multiply the numerators.

$$\frac{3}{5} \times \frac{7}{2} = \frac{3(7)}{\square} = \frac{21}{\square}$$

Step 3. Multiply the denominators.

$$\frac{3}{5} \times \frac{7}{2} = \frac{21}{5(2)} = \frac{21}{10}$$

$$\text{So, } \frac{3}{5} \times \frac{7}{2} = \frac{21}{10}$$

Step 4. Express the answer to the simplest form or lowest term, if possible. To simplify the answer, change the improper fraction to mixed fraction by dividing the numerator by its denominator.

$$\frac{3}{5} \times \frac{7}{2} = \frac{21}{10} \text{ or } 2 \frac{1}{10}$$

$$\begin{array}{r} 2 \\ 10 \overline{) 21} \\ \underline{-20} \\ 1 \end{array}$$

Thus, $2 \frac{1}{10}$ meters of the cloth were used for pants.

Now that you are already fully aware of how multiplying fractions is done, you can now move forward and face the challenge of solving a kind of problem such as the one given below.

Find the answer in:

$$\left(1 - \frac{1}{2} \right) \times \left(1 - \frac{1}{3} \right) \times \left(1 - \frac{1}{4} \right) \times \left(1 - \frac{1}{5} \right) \times \dots \times \left(1 - \frac{1}{100} \right)$$

What should be done so we can come up with the correct answer the easy way?

This kind of problem can be solved by **simplifying strategy** as shown below.

$$\begin{array}{ccccccc} \left(1 - \frac{1}{2} \right) & \times & \left(1 - \frac{1}{3} \right) & \times & \left(1 - \frac{1}{4} \right) & \times & \left(1 - \frac{1}{5} \right) \times \dots \times \left(1 - \frac{1}{100} \right) & \diamond \text{ Simplify each factor in the parenthesis.} \\ \downarrow & & \downarrow & & \downarrow & & \downarrow & \\ \frac{1}{2} & \times & \frac{2}{3} & \times & \frac{3}{4} & \times & \frac{4}{5} \times \dots \times \frac{99}{100} \end{array}$$

Notice the pattern shown in fractions to be multiplied above. Starting from the first fraction, you will see that the denominator is the same as the numerator of the fraction next to it. It

means that the denominator is also a factor of the numerator and vice versa. With this, we can use cross cancellation on the factors.

$$\begin{array}{ccccccc}
 (1 - \frac{1}{2}) & \times & (1 - \frac{1}{3}) & \times & (1 - \frac{1}{4}) & \times & (1 - \frac{1}{5}) \times \dots \times (1 - \frac{1}{100}) \\
 \downarrow & & \downarrow & & \downarrow & & \downarrow \\
 \frac{1}{\cancel{2}} & \times & \frac{1}{\cancel{2}} \times \frac{\cancel{3}}{\cancel{3}} & \times & \frac{1}{\cancel{3}} \times \frac{\cancel{4}}{\cancel{4}} & \times & \frac{1}{\cancel{4}} \times \dots \times \frac{99}{100}
 \end{array}$$

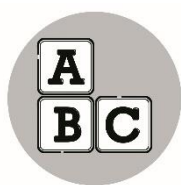
❖ Do the cross cancellation of factors.

If the pattern continues, the denominator 5 and the numerator 99 will also be cancelled.

$$\frac{1}{\cancel{2}} \times \frac{1}{\cancel{2}} \times \frac{\cancel{3}}{\cancel{3}} \times \frac{\cancel{4}}{\cancel{4}} \times \dots \times \frac{\cancel{99}}{\cancel{99}} \times \frac{1}{100}$$

Now we have $\frac{1}{1} \times \frac{1}{1} \times \frac{1}{1} \times \frac{1}{1} \times \dots \times \frac{1}{100}$ all along as we continue the process of cross cancellation on our factors.

In multiplying fractions, we multiply all numerators and then multiply all denominators. In this case, we have 1 as numerator of all the factors while the denominators are all 1 except for the last factor which is 100. If numerators and denominators are multiplied, they give 1 and 100 as their products respectively. Thus, giving us the answer which is $\frac{1}{100}$.



What's More

Find the product. Express the answer to the simplest form or lowest term, if needed. Write your answers on your answer sheet.

1. $\frac{4}{5} \times 1\frac{2}{3} = \boxed{}$

4. $\frac{4}{9} \times 1\frac{1}{4} = \boxed{}$

2. $\frac{3}{6} \times 2\frac{2}{5} = \boxed{}$

5. $\frac{2}{3} \times \frac{3}{4} \times \frac{4}{5} \times \frac{5}{6} \times \dots \times \frac{49}{50} = \boxed{}$

3. $\frac{2}{7} \times 1\frac{1}{3} = \boxed{}$



What I Have Learned

In multiplying simple fractions and mixed fractions,

- First, change the mixed fraction to improper fraction by multiplying the denominator by the whole number. Then add the product to the numerator to get the new numerator. Copy the denominator of the mixed fraction.
- Multiply the numerators.
- Multiply the denominators.
- Express answer to the simplest form or lowest term, if needed. To simplify the answer, change the improper fraction to mixed fraction by dividing the numerator by its denominator.



What I Can Do

A. Multiply the fractions. Express the answer to the simplest form or lowest term, if needed. Write your answers on your answer sheet.

1. $\frac{1}{3} \times 2\frac{3}{4} = \boxed{}$

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

2. $\frac{2}{5} \times 3\frac{1}{3} = \boxed{}$

5. $\frac{1}{4} \times 5\frac{1}{2} = \boxed{}$

3. $\left(1 - \frac{1}{2}\right) \times \left(1 - \frac{2}{4}\right) \times \left(1 - \frac{3}{6}\right) \times \left(1 - \frac{4}{8}\right) \times \left(1 - \frac{5}{10}\right) = \boxed{}$

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

6. Joseph harvested $5\frac{3}{4}$ kilograms of pechay from his vegetable garden. He sold $\frac{1}{2}$ of it in his neighbors. How many kilograms were sold?

7. A farmer has 2 sons and $10\frac{1}{2}$ hectares of rice field. He gave $\frac{1}{4}$ of his land to the eldest and $\frac{3}{7}$ to the youngest. How many hectares of the land did the farmer give to his sons?



Assessment

Solve for the product of the following fractions. Express the answer to the simplest form or lowest term, if needed. Write your answers on your answer sheet.

1. $\frac{1}{5} \times 2\frac{1}{4} = \boxed{}$

2. $\frac{3}{7} \times 1\frac{1}{5} = \boxed{}$

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

4. $\frac{1}{8} \times 1\frac{1}{5} = \boxed{}$

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

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

7. $\frac{2}{5} \times 4\frac{2}{4} = \boxed{}$

8. $\frac{5}{7} \times 2\frac{1}{4} = \boxed{}$

9. $\frac{3}{5} \times 2\frac{5}{8} = \boxed{}$

10. $(2 - 1\frac{1}{2}) \times (2 - 1\frac{2}{4}) \times (2 - 1\frac{3}{6}) \times (2 - 1\frac{4}{8}) \times (2 - 1\frac{5}{10}) = \boxed{}$



Additional Activities

A. Look for the missing number to make the number sentence true. Write your answers on your answer sheet.

$$1. \quad \frac{3}{9} \times 3\frac{2}{3} = \frac{3}{9} \times \frac{\square}{3} = \frac{33}{27} \text{ or } 1\frac{6}{27}$$

$$2. \quad \frac{1}{2} \times 4\frac{2}{3} = \frac{1}{2} \times \frac{\square}{3} = \frac{14}{6} \text{ or } 2\frac{2}{6} \text{ or } 2\frac{1}{3}$$

$$3. \quad \frac{3}{5} \times 3\frac{1}{3} = \frac{3}{5} \times \frac{\square}{3} = \frac{30}{15} \text{ or } 2$$

$$4. \quad \frac{3}{7} \times 2\frac{1}{4} = \frac{3}{7} \times \frac{\square}{4} = \frac{27}{28}$$

$$5. \quad \left(\frac{1}{n} - \frac{1}{a} \right) \times \left(\frac{1}{n} - \frac{1}{b} \right) \times \left(\frac{1}{n} - \frac{1}{c} \right) \times \left(\frac{1}{n} - \frac{1}{d} \right) \times \dots \times \left(\frac{1}{n} - \frac{1}{z} \right) = ?$$

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

6. Joyce has $2\frac{1}{2}$ kilograms of meat in the refrigerator. She used $\frac{3}{4}$ of the meat for her recipe. How many kilograms of meat were used?

7. Mrs. Dela Cruz uses $\frac{3}{4}$ tablespoons of salt for every kilograms of ground pork. How many tablespoons of salt will she use for $3\frac{1}{2}$ kilograms of ground pork?

8. Mother bought $2\frac{1}{2}$ kgs. of mangoes. Pearl ate $\frac{1}{5}$ of this for snacks and lunch. How much were eaten by Pearl?

9. Mark bought $2\frac{1}{2}$ kgs. of dressed chicken. He cooked $\frac{2}{15}$ of it for menudo and $\frac{4}{15}$ of it for tinola. How many kilograms of dressed chicken did Mark cook?

10. A fish vendor has $1\frac{3}{4}$ kgs of fish left. He gave $\frac{1}{4}$ of the fish to Philip and $\frac{2}{3}$ of the fish to King. How many kilogram of fish was left?



Answer Key

<p>What I Know</p> <p>1. $1\frac{11}{25}$</p> <p>2. $1\frac{3}{2}$</p> <p>3. $\frac{20}{11}$</p> <p>4. $1\frac{17}{40}$</p> <p>5. $2\frac{9}{2}$</p> <p>6. $2\frac{6}{1}$</p> <p>7. $1\frac{7}{25}$</p> <p>8. $1\frac{7}{24}$</p> <p>9. $\frac{11}{16}$</p> <p>10. $1\frac{6}{5}$</p>	<p>What's In</p> <p>A. $1\frac{25}{10}$</p> <p>2. $\frac{5}{8}$</p> <p>3. $\frac{12}{39}$</p> <p>B. $4\frac{1}{2}$</p> <p>5. $\frac{1}{8}$</p>	<p>What's More</p> <p>1. $1\frac{1}{3}$</p> <p>2. $1\frac{1}{5}$</p> <p>3. $\frac{21}{8}$</p> <p>4. $\frac{9}{5}$</p> <p>5. $\frac{1}{25}$</p>
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<p>What I Can Do</p> <p>A.</p> $1. \frac{11}{12}$ $2. 1\frac{1}{3}$ $3. \frac{32}{1}$ $4. \frac{12}{5}$ $5. 1\frac{8}{3}$ <p>B.</p> $6. 2\frac{8}{7}$ $7. 7\frac{1}{8}$	<p>Assessment</p> $1. \frac{9}{20}$ $2. \frac{18}{35}$ $3. 1\frac{17}{18}$ $4. \frac{20}{3}$ $5. \frac{20}{7}$ $6. 1\frac{9}{1}$ $7. 1\frac{5}{4}$ $8. 1\frac{28}{17}$ $9. 1\frac{40}{23}$ $10. \frac{32}{1}$	<p>Additional Activities</p> <p>A.</p> $1. 11$ $2. 14$ $3. 10$ $4. 9$ $5. 0$ <p>B.</p> $6. 1\frac{8}{7}$ $7. 2\frac{5}{8}$ $8. \frac{1}{2}$ $9. 1$ $10. \frac{48}{7}$
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References

- Most Essential Learning Competencies(MELC) in Mathematics 6
- The Art of Problem Solving

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