

## Learning Outcome:

Students should be able to multiply & divide fractions and interpreting division as a multiplicative inverse

## MULTIPLYING FRACTIONS

**Remember!**  
1. Multiply  
2. Multiply  
3. Simplify

Step 1: Write whole number as fraction; write mixed number as improper fraction.

Step 2: Multiply the numerators

Step 3: Multiply the denominators

Step 4: Write answer in simplest terms

Fraction multiplied by a fraction

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

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

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

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

Whole number multiplied by a fraction

$$9 \times \frac{2}{5}$$

$$\frac{9}{1} \times \frac{2}{5} = \frac{18}{5}$$

$$\frac{9}{1} \times \frac{2}{5} = \frac{18}{5}$$

$$\frac{18}{5} = 3\frac{3}{5}$$

Fraction multiplied by a mixed number

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

$$\frac{2}{3} \times \frac{7}{3} = \frac{14}{9}$$

$$\frac{2}{3} \times \frac{7}{3} = \frac{14}{9}$$

$$\frac{14}{9} = 1\frac{5}{9}$$

## DIVIDING FRACTIONS

**Remember!**

**Keep**  
First fraction stays the same

**Change**  
Operation changes from  $\div$  to  $\times$

**Flip**  
Flip 2nd fraction for reciprocal

Step 1: Write whole number as fraction; write mixed number as improper fraction.

Step 2: Find the reciprocal of the divisor (the number you are dividing by).

Step 3: The reciprocal allows you to change the operation from division to multiplication.

Step 4: Multiply the fractions.

Step 5: Write the answer in simplest terms.

Fraction divided by a fraction

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

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

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

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

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

Whole number divided by a fraction

$$9 \div \frac{1}{3}$$

$$\frac{9}{1} \div \frac{1}{3}$$

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

$$\frac{9}{1} \times \frac{3}{1} = \frac{27}{1}$$

$$\frac{27}{1} = 27$$

Fraction divided by a mixed number

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

$$\frac{2}{3} \div \frac{7}{3}$$

$$\frac{2}{3} \div \frac{7}{3}$$

$$\frac{2}{3} \times \frac{3}{7} = \frac{6}{21}$$

$$\frac{6}{21} = \frac{2}{7}$$

## Example 2 I

$$(a) \quad 2 \times 1\frac{1}{3}$$

Change mixed number into improper fraction and solve

$$2 \times \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} = \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}}$$

$$= \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}}$$

Change improper fraction into mixed number for your final answer.



**Please copy the step-by-step workings and answers into your notes.**

# Example 2 1

(b)  $\frac{1}{3}$  of  $\frac{1}{4}$

$$\frac{1}{3} \square \frac{1}{4} = \frac{\square}{\square}$$

What is "of" ?



Choose and drag any of these maths operations that will define the word "of"



**K** eep

1<sup>st</sup> fraction stays the same

**C** hange

Operation changes from ÷ to ×

**F** lip

Flip 2<sup>nd</sup> fraction for reciprocal

(c)  $\frac{1}{4} \div \frac{3}{10}$

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



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(d)  $7\frac{1}{2} \div 2\frac{1}{4}$

Step 1: Change mixed number into improper fraction.

$$\frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} \div \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}}$$

Step 2: Apply the KCF method and solve.

$$\frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} \times \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} = \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} = \boxed{\phantom{00}}\frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}}$$

If your answer is improper fraction,  
Convert it to mixed numbers in  
simplest form



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Example 22:  $\frac{4}{7}$  of a number is 84. Find the number.

Let  $y$  be the number,

$$\frac{4}{7} \text{ of } \boxed{\text{A number}} = 84$$

$$\frac{4}{7} \times y = 84$$

$$y = \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} \times 84 \quad \left. \vphantom{\frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}}} \right\} \text{ simplify}$$

Hint:  
Multiplicative inverse  
(reciprocal) of  $\frac{4}{7}$

$$= 147$$



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## Example 23

Calculate five-eighths of fourteen dollars

$$\frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} \text{ of } \boxed{\phantom{00}}$$

$$\frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} = \$ 8.75$$

## Example 24

Aqil has 15 shirts in his closet. If 2 out of every 3 of these shirts are striped, how many unstriped shirts does he have in his closet?

Watch the video explanation:

**Answer** =  $\frac{\boxed{\phantom{00}}}{\phantom{00}}$  unstriped shirts



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