

Glossary Class Example

August 27th

Coordinate Plane - a graph used to plot ordered pairs (x,y)

Quadrants - 4 sections that make up a coordinate plane

Origin - where the x and y axis cross (0,0)

y-axis - vertical line (up and down) of coordinate plane

x-axis - horizontal line (side to side) of coordinate plane

What do you remember about fractions?

- Denominator = Bottom Numerator = Top
- Mixed Number: has a whole number with the fraction (ex: 2 1/4)
- Improper: Larger numerator than denominator (ex: 15/4)
- Like Fractions have the same denominator
- To find common denominators use the LCM (least common multiple)
 - > need common denominators only when adding and subtracting
 - > ex: 3/4 and 4/5

– 4: 4, 8, 12, 16, 20

– 5: 5, 10, 15, 20, 25

– Make equivalent fractions by multiplying the numerator and denominator by the same multiple.

$$\frac{3 \times 5}{4 \times 5} = \frac{15}{20}$$

$$\frac{4 \times 4}{5 \times 4} = \frac{16}{20}$$

- Can not multiply or divide with mixed numbers must convert to improper fractions. You can Add and Subtract with mixed numbers.
 - > to convert to a mixed number to improper multiply the denominator by the whole number and add the numerator. Keep the same denominator

$$3\frac{4}{7} = \frac{25}{7}$$

$$7 \times 3 + 4 = 25$$

- > to convert a improper fraction to a mixed number simply divide.
 - denominator does not change
 - remainder is your numerator

$$\frac{35}{3} = 11\frac{2}{3}$$

$$\begin{array}{r} 11 \\ 3 \overline{) 35} \\ \underline{-33} \\ 2 \\ \underline{-2} \\ 0 \end{array}$$

- Simplifying means to reduce or make smaller. Use division to create smaller equivalent fractions
 - > Simplest form: fraction reduced to it's smallest possible form. to do so divide by the GCF (greatest common factor) of the numerator and denominator.
 - (numerator of 1 or no common factors between numerator and denominator)
 - ex: 30/40

30	40
1 30	1 40
2 15	2 20
3 10	4 10
5 6	5 8

GCF = 10

$$\frac{30}{40} \div \frac{10}{10} = \frac{3}{4}$$

FRACTIONS REVIEW

← numerator
 ← denominator

NO DENOMINATOR? NO PROBLEM!
 Any number can be made into a fraction by adding a denominator of 1.

EQUIVALENT FRACTIONS
 answers in this section may vary from student to student
 If you multiply or divide the numerator and denominator by the same number, you get an equivalent fraction.

$\frac{3}{6} = \frac{1}{2}$
 $\frac{10}{30} = \frac{20}{60}$
 $\frac{3}{4} = \frac{6}{8}$

SIMPLIFYING FRACTIONS
 A fraction is fully simplified when the only number that divides evenly into both the numerator and denominator is 1. To simplify a fraction divide the numerator and denominator by the greatest common factor (GCF)

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

Handwritten notes: 18 factors (1, 2, 3, 6, 9, 18), 24 factors (1, 2, 3, 4, 6, 8, 12, 24). GCF is 6. 18 ÷ 6 = 3, 24 ÷ 6 = 4.

ADDITION & SUBTRACTION
 We can only add and subtract fractions if they are written with the same denominator

- Rewrite as like fractions with the same denominator
- Add or subtract the numerator
- The denominator stay the same
- Simplify, if possible

MULTIPLICATION
 We can multiply fractions with any denominator.

- Multiply the numerator
- Multiply the denominator
- Simplify, if possible

DIVISION
 We can divide fractions by rewriting them as a multiplication problem.

- The first fraction stays the same
- Division becomes multiplication
- flip (take the reciprocal of) the second fraction
- Follow the rules for multiplication

Atarspiration.

*** Multiplication and Division **CAN NOT** be done with mixed numbers. Must convert to improper fractions!!!!

SOME EXAMPLES ARE SOLVED FOR YOU BASED ON OUR IN CLASS REVIEW. THE REST ARE YOUR RESPONSIBILITY TO COMPLETE BY THE NEXT NB CHECK!!

Convert to Improper Fractions:

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

1) $5 \frac{3}{7} = \frac{5 \times 7 + 3}{7} = \frac{35 + 3}{7} = \frac{38}{7}$

Convert to Mixed Numbers:

1. $\frac{58}{6}$
2. $\frac{37}{4}$
3. $\frac{27}{5}$
4. $\frac{49}{3}$

DIVIDE!!! 1) 9 ← whole number

$$\begin{array}{r} 6 \overline{)58} \\ \underline{-54} \\ 4 \end{array}$$

← remainder/numerator

Write 2 equivalent fractions for each:

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

$\frac{17}{3}, \frac{54}{6}$

Addition:

1. $12 \frac{3}{4} + 2 \frac{1}{5}$
2. $12 \frac{5}{9} + 9 \frac{1}{3}$

1) $12 \frac{3}{4} + 2 \frac{1}{5}$

Subtraction: (practice regrouping)

1. $12 \frac{3}{8} - 4 \frac{3}{4}$
2. $9 \frac{3}{8} - 2 \frac{1}{2}$

*At Bottom!!

$$\begin{array}{r} 12 \frac{3}{4} + 2 \frac{1}{5} \\ \downarrow \quad \downarrow \\ 12 \frac{3}{4} + 2 \frac{1}{5} \\ \downarrow \quad \downarrow \\ 14 \frac{3}{4} + 2 \frac{1}{5} \\ \downarrow \quad \downarrow \\ 14 \frac{15}{20} + 2 \frac{4}{20} \\ \downarrow \quad \downarrow \\ 15 \frac{19}{20} \end{array}$$

Multiplication:

1. $(5 \frac{2}{3})(3 \frac{1}{4})$
2. $3 \frac{3}{6} \cdot 2 \frac{1}{2}$

*Must convert to improper first!

$(5 \frac{2}{3})(3 \frac{1}{4})$

$7 \frac{3}{5} \div 2 \frac{1}{3}$

$$\begin{array}{r} 18 \\ 12 \overline{)221} \\ \underline{12} \\ 101 \\ \underline{-96} \\ 5 \end{array}$$

$5 \cdot 3 + 2 \cdot 3 + 1$

$(\frac{17}{3})(\frac{13}{4})$

$\frac{221}{12} = 18 \frac{5}{12}$

$\frac{38}{5} \div \frac{7}{3}$

$\frac{38}{5} \times \frac{3}{7}$

$\frac{114}{35} = 3 \frac{9}{35}$

Keep Change to Mult. Find the Reciprocal

Subtraction by Regrouping!!!

$12 \frac{2}{3} - 4 \frac{3}{4}$

$$\begin{array}{r} 12 \quad \downarrow \times 4 \quad \downarrow \times 3 \\ -4 \quad \frac{8}{12} - \frac{9}{12} \\ \hline 8 \quad \frac{12}{12} - \frac{1}{12} \\ 7 \quad \frac{11}{12} \end{array}$$

$7 \frac{11}{12}$

$9 \frac{3}{8} - 2 \frac{1}{2}$

$$\begin{array}{r} 9 \quad \frac{3}{8} - \frac{4}{8} \\ -2 \quad \frac{8}{8} - \frac{4}{8} \\ \hline 7 \quad \frac{3}{8} - \frac{1}{8} \\ 6 \quad \frac{8}{8} - \frac{1}{8} \end{array}$$

$6 \frac{7}{8}$

- Step 1: Separate the mixed numbers into 2 separate problems.
 - Step 2: Subtract the whole numbers
 - Step 3: Subtract the fractions (remember you must create like fractions)
 - Step 4: You can not have a negative number on your fractions. Borrow from the whole number (as seen in red)
- ***remember that a whole with fractions have the same numerator and denominator. Ex. $\frac{2}{2} = 1$ $\frac{10}{10} = 1$ $\frac{8}{8} = 1$
- *** When borrowing chose the denominator that you already have.

1. Miguel needs eggs to bake a cake. He gets $2\frac{1}{4}$ cartons of eggs from his school and $4\frac{1}{6}$ cartons of eggs from a restaurant. If each carton contains 12 eggs, how many eggs did Miguel get?
2. A science class noticed a strange moss growing in their classroom after a science experiment. After one week the moss had $\frac{2}{5}$ of the chairs. After another week it had covered another $\frac{1}{3}$ of the chairs. How many chairs did it cover after 2 weeks?
3. A recipe calls for $\frac{2}{3}$ gallon of juice in order to make punch. If you need to make $1\frac{1}{2}$ batches how much juice would you need?
4. It takes 45 cocoa beans to make one chocolate bar. How many beans would it take to make $\frac{1}{3}$ of a bar?
5. Jessica bought $\frac{8}{9}$ of a pound of chocolates and ate $\frac{1}{3}$ of a pound. How much was left?
6. Sam rode his bike $\frac{2}{5}$ of a mile and walked another $\frac{3}{4}$ of a mile. How far did he travel?
7. The track is $\frac{3}{5}$ of a mile long. If Tyrone jogged around it twice, how far did he run?
8. An equilateral triangle measures $3\frac{1}{2}$ inches on one side. What is the perimeter of the triangle?
9. Sandra bought $2\frac{3}{4}$ yards of red fabric and $1\frac{1}{4}$ of blue. How much cloth did she buy in all?
10. An airplane covers 50 miles in $\frac{1}{5}$ hours. How many miles can the airplane cover in 5 hours?

Adding & Subtracting Fractions

Write a step-by-step process for adding OR subtracting two fractions with unlike denominators.

- Find Common Denominators
- Either make improper OR add/sub whole numbers followed by the fractions.
- Simplify/Convert as needed.

Word Problems

1. Collin bought $\frac{1}{2}$ a pound of chocolate at Rocky Mountain Chocolate factory. Later, they went to The Sweet Shoppe and he bought $\frac{6}{9}$ of a pound more chocolate. How much chocolate did he buy that day?

$$\frac{1}{2} + \frac{6}{9} \rightarrow \frac{9}{18} + \frac{12}{18} = \frac{21}{18} \rightarrow \frac{7}{6} = 1\frac{1}{6}$$

(Handwritten notes: 9 x 2, 9 x 3, 3 ÷ 3, 3 ÷ 3)

2. On Monday, Amanda runs $1\frac{1}{6}$ miles, and on Tuesday, she runs $2\frac{1}{2}$ miles. How far did she run on Monday and Tuesday combined?

$$1\frac{1}{6} + 2\frac{1}{2} \rightarrow \frac{1}{6} + \frac{3}{6} = \frac{4}{6} \div 2 = \frac{2}{3}$$

(Handwritten notes: 1 + 2 = 3, x 3, 2 ÷ 2)

$3\frac{2}{3}$ mi

3. If Amanda ran $\frac{3}{8}$ of a mile on Wednesday, how much more did she run on Monday and Tuesday than on Wednesday?

$$3\frac{2}{3} - \frac{3}{8} \rightarrow \frac{16}{24} - \frac{9}{24} = \frac{7}{24}$$

(Handwritten notes: x 8, 9 x 3)

$3\frac{7}{24}$ mi

4. Jacob was baking cupcakes for Teacher Appreciation Week. For one batch, he used 1 cup of flour. On another batch, he only used $\frac{5}{11}$ of a cup. How much more did he use in the first batch than in the second batch?

$$1 - \frac{5}{11} \rightarrow \frac{11}{11} - \frac{5}{11} = \frac{6}{11}$$

(Handwritten note: 1 = 11/11)

$\frac{6}{11}$ cup

Multiplying Fractions

Write a step-by-step process for multiplying two fractions with unlike denominators.

mixed numbers must be improper
 mult + num
 mult denom.
 Always Simplify

Word Problems

1. Eugin plays a game of chess in $\frac{4}{5}$ of an hour. How long will it take him to play 6 games of chess?

$$\frac{6}{1} \times \frac{4}{5} = \frac{24}{5} \rightarrow 4 \frac{4}{5}$$

$$5 \overline{) 24} \begin{array}{r} 4 \\ -20 \\ \hline 4 \end{array}$$

2. Katie is planting a garden for her science fair project. She needs $\frac{2}{3}$ of a cup of soil to go in 8 different pots. How many cups of soil does she need in total?

$$8 \times \frac{2}{3} = \frac{16}{3} \rightarrow 5 \frac{1}{3}$$

$$3 \overline{) 16} \begin{array}{r} 5 \\ -15 \\ \hline 1 \end{array}$$

3. Easton enjoys playing football at recess. He spends $\frac{1}{4}$ of an hour at recess each day. How many hours does he spend at recess in a 5 day week?

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

$$4 \overline{) 5} \begin{array}{r} 1 \\ -4 \\ \hline 1 \end{array}$$

Ⓐ $\frac{1}{4} \times \frac{7}{9} =$

Ⓑ $\frac{3}{5} \times \frac{3}{4} =$

Ⓒ $\frac{1}{2} \times \frac{5}{7} =$

ON YOUR OWN!

Dividing Fractions

Write a step-by-step process for dividing two fractions with unlike denominators.

- Change Mixed Numbers to Improper Fractions
 - > multiply denominator by whole number and add the numerator
- K, C, F
 - > Keep -- 1st Fraction Remains the same
 - > Change -- Division to multiplication
 - > Flip -- Find the reciprocal of the 2nd fractions
- Follow the rules for multiplication of Fractions

Word Problems

1. Connor ran $2\frac{2}{3}$ miles. He stopped every $\frac{1}{3}$ of a mile for water. How many times did he stop for water?

$$2\frac{2}{3} \div \frac{1}{3} \rightarrow \frac{8}{3} \times \frac{3}{1} = \frac{24}{3}$$

8

$$\begin{array}{r} 3 \overline{)24} \\ \underline{-24} \\ 0 \end{array}$$

2. Lucy used $3\frac{3}{4}$ cups of sugar for her lemonade stand. She divided the sugar, in equal amounts, into 6 pitchers. How much sugar went into each pitcher?

$$3\frac{3}{4} \div \frac{1}{6} \rightarrow \frac{15}{4} \times \frac{1}{6} = \frac{15}{24} \div 3 = \frac{5}{8} \text{ c.}$$

3. Sophia had $\frac{1}{4}$ of her birthday cake leftover. She split that cake between her and her best friend. How much of the cake did they each get?

$$\frac{1}{4} \div \frac{2}{1} \rightarrow \frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$$

Ⓐ $3 \div \frac{1}{5} =$

Ⓑ $\frac{3}{7} \div 2 =$

Ⓒ $\frac{1}{2} \div \frac{1}{6} =$

ON YOUR OWN!

Name: _____ Date: _____

Fraction Operations Self-Checking Sheet

Start with question 1. Insert the answer from question 1 onto the line in question 2 and then answer question 2. Repeat until you have completed all of the questions in this manner. If you answer all questions correctly, you should end up with $2 \frac{1}{4}$ as your final answer!

3. $\frac{9}{16} + \frac{8}{16}$
 $\frac{17}{16} \rightarrow \frac{1}{16}$
 $+ 1$
 $2 \frac{1}{16}$

1. $1 \frac{7}{8} \times 1 \frac{1}{4} = 2 \frac{11}{32}$

1. $\frac{15}{8} \times \frac{5}{4} = \frac{75}{32} = 2 \frac{11}{32}$

2. $2 \frac{11}{32} \div 1 \frac{1}{2} = 1 \frac{9}{16}$

2. $\frac{75}{32} \times \frac{2}{3} = \frac{150}{96} = \frac{54}{96}$

3. $1 \frac{9}{16} + \frac{1}{2} = 2 \frac{1}{16}$

$\frac{54}{96} \div 4 = \frac{9}{16}$
 $\frac{9}{16} \div 4 = \frac{9}{16}$

4. $2 \frac{1}{16} \times \frac{2}{5} = \frac{33}{40}$

4. ~~$\frac{33}{16} \times \frac{2}{5}$~~ = $\frac{33}{40}$

6. $1 + 1 = 2$
 $\frac{3}{8} + \frac{4}{8} = \frac{7}{8}$
 $2 \frac{7}{8}$

5. $\frac{33}{40} \times 1 \frac{2}{3} = 1 \frac{3}{8}$

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

5. ~~$\frac{33}{40} \times \frac{5}{3}$~~ = $\frac{11}{8} = 1 \frac{3}{8}$

7. $\frac{5}{8} + 2 \frac{7}{8} = 3 \frac{1}{2}$

8. $3 \frac{1}{2} - \frac{1}{8} = 3 \frac{3}{8}$

7. $\frac{7}{8} + \frac{5}{8} = \frac{12}{8} \rightarrow \frac{4}{8} \div 4 = \frac{3}{2} = 1 \frac{1}{2}$
 $+ 2 = 3 \frac{1}{2}$

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

9. $3 \frac{3}{8} - 1 \frac{5}{8} = 1 \frac{3}{4}$

10. $3 \frac{15}{16} \div 1 \frac{3}{4} = 2 \frac{1}{4}$

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

10. $3 \frac{15}{16} \div 1 \frac{3}{4}$

$\frac{63}{16} \div \frac{7}{4}$
 $\frac{63}{16} \times \frac{4}{7} = \frac{63 \times 4}{16 \times 7} = \frac{252}{112} = \frac{9 \times 28}{4 \times 28} = \frac{9}{4} = 2 \frac{1}{4}$

$\frac{16}{48} \times \frac{48}{63} = \frac{16}{63}$

"cross simplify!"
 $\frac{9}{4} \times \frac{1}{1} = \frac{9}{4} = 2 \frac{1}{4}$



ON YOUR OWN

Fraction Operations

Name: _____



Date: _____

Solve each problem. Show your work!

Code-Word Math

#1. $13\frac{1}{2} - 10\frac{1}{9}$	#6. $2\frac{2}{5} + 14\frac{1}{3}$
#2. $\frac{2}{3} + \frac{14}{17}$	#7. $\frac{4}{9} - \frac{5}{18}$
#3. $\frac{18}{21} \times 3\frac{1}{4}$	#8. $\frac{1}{7} \times \frac{3}{13}$
#4. $\frac{1}{4} \div \frac{5}{16}$	#9. $11\frac{5}{10} + \frac{3}{5}$
#5. $2\frac{3}{7} \div 1\frac{13}{21}$	#10. $2\frac{1}{2} \times 1\frac{1}{8}$

Find the answer to each problem above (from Table 1) in Table 2 and then write the corresponding letter in Table 3.

Answer	→	Letter		Answer	→	Letter
$3\frac{7}{18}$		C		$\frac{4}{5}$		P
$\frac{1}{6}$		X		$\frac{3}{91}$		I
$1\frac{1}{2}$		L		$1\frac{25}{51}$		O
$12\frac{1}{10}$		N		$2\frac{13}{16}$		G
$16\frac{11}{15}$		E		$2\frac{11}{14}$		M

Problem #	#1.	#2.	#3.	#4.	#5.	#6.	#7.	#8.	#9.	#10.
Code Word										

Share the code word with your teacher to see if it is correct.

le 3

Name:



Date:

Solve each problem. Show your work

<p>#1. $7\frac{4}{5} - 3\frac{2}{9}$ $7-3=4$</p> <p>$\swarrow \times 9$ $\searrow \times 5$</p> $\frac{36}{45} - \frac{10}{45} = \frac{26}{45}$ <p>$4\frac{26}{45}$</p>	<p>#6. $16\frac{3}{8} + 4\frac{2}{12}$ $16+4=20$</p> <p>$\swarrow \times 3$ $\searrow \times 2$</p> $\frac{9}{24} + \frac{4}{24} = \frac{13}{24}$ <p>$20\frac{13}{24}$</p>
<p>#2. $\frac{5}{8} + \frac{4}{11}$ $\searrow \times 8$</p> <p>$\swarrow \times 11$</p> $\frac{55}{88} + \frac{32}{88} = \frac{87}{88}$	<p>#7. $\frac{1}{9} - \frac{1}{11}$</p> <p>$\swarrow \times 11$ $\searrow \times 9$</p> $\frac{11}{99} - \frac{9}{99} = \frac{2}{99}$
<p>#3. $\frac{14}{15} \times 2\frac{3}{5}$</p> $\frac{14}{15} \times \frac{13}{5} = \frac{182}{75}$ <p>$2\frac{32}{75}$</p>	<p>#8. $\frac{10}{12} \times \frac{4}{7}$</p>
<p>#4. $\frac{6}{10} \div \frac{1}{2}$</p> <p>$\frac{6}{10} \div \frac{1}{2} = \frac{6}{5} = 1\frac{1}{5}$</p>	<p>#9. $11\frac{5}{7} + \frac{11}{14}$</p>
<p>#5. $4\frac{8}{9} \div 2\frac{2}{10}$</p> $\frac{44}{9} \div \frac{22}{10}$	<p>#10. $4\frac{1}{2} \times 3\frac{9}{10}$</p>

~~$\frac{44}{9} \times \frac{10}{22} = \frac{20}{9}$~~

$2\frac{4}{9}$