

Fractions (and YOU)

Quick review of operations with fractions

top# = numerator
bottom = denominator

a fraction is another way
to show division OR
parts compared to whole



$\frac{1}{3}$ shaded

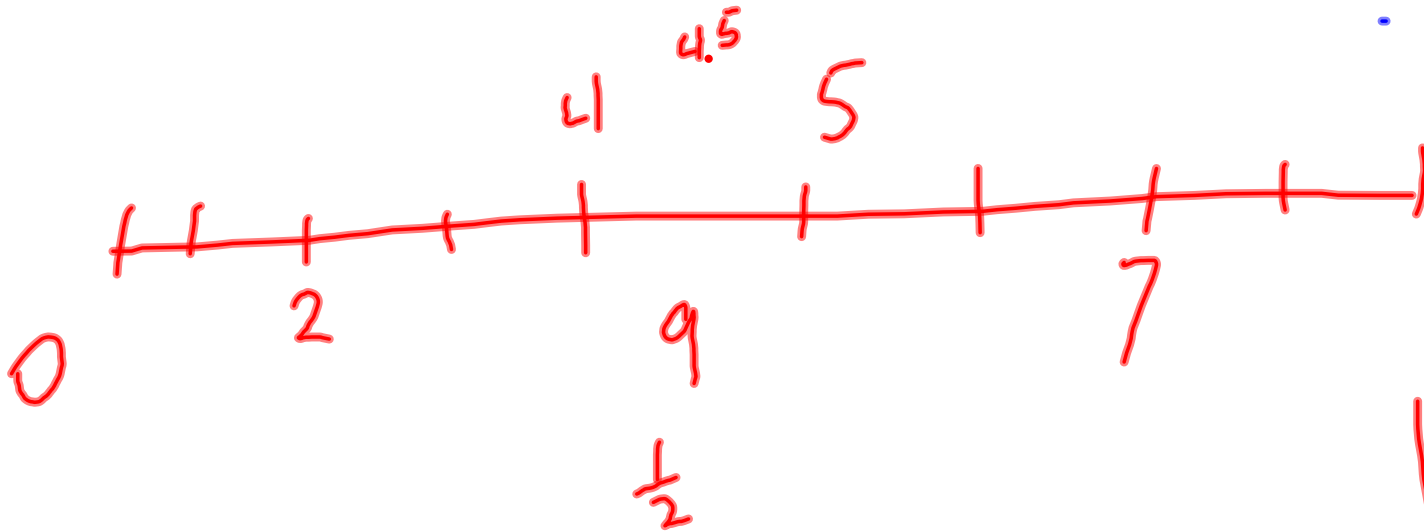
=

$1 \div 3$

=

$3 \overline{) 1.0}$
 $\underline{09}$

...



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=

$$1 \div 3 =$$

$$3 \overline{) 1.0} \\ \underline{09} \\ \dots$$

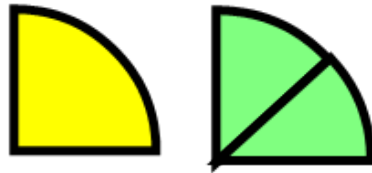
Adding Fractions -

1. find a common denominator
2. change one or both fractions so the denominator is the same and ADD the numerators together (remember, if you multiply the denominator by a number to change it, you MUST multiply the numerator by the same number).
3. When you add fractions, you DO NOT add the denominators together.

$$\frac{6}{8} \xrightarrow{-2} \frac{3}{4} + \frac{7}{8}$$

$$\frac{6}{8} + \frac{7}{8} = \frac{13}{8} = 1\frac{5}{8}$$

Reducing Fractions (simplest form)



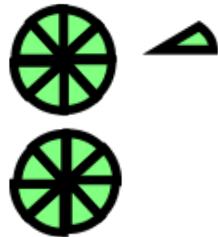
0 $\frac{1}{2}$ 1
 ! | |
 0 1 12

Improper fractions are fractions that have a greater numerator than denominator. Ex:

$$\frac{17}{8}$$

To simplify improper fractions, find out how many times the denominator will fit in the numerator. This becomes your whole number...

How many times does 8 go into 17?



$$8 \overline{)17} \begin{array}{r} 2 \\ \underline{16} \\ 1 \end{array}$$

becomes $2\frac{1}{8}$

$$\frac{17}{8} = 2\frac{1}{8}$$

IN other words, divide the numerator by the denominator. The result should be a whole number. If there is a remainder, that becomes the new numerator with the original denominator on the bottom.

Operations with Fractions

We NEED to find a common denominator when we

ADD or Subtract fractions

We DO NOT need to find a common denominator when we

Multiply or Divide fractions



Name _____

Study Guide

Adding and Subtracting Mixed Numbers

To add or subtract mixed number:

1. Add or subtract the fractions. Rename if necessary.
2. Add or subtract the whole numbers.
3. Rename and simplify.

To add fractions: 1. find common denominator.

2. Multiply the numerator in each fraction by the same number you multiplied the denominator by to get to a common denominator (example: 3×2 is 6 [common denominator], so 2×2 gives us the numerator).

3. Add the numerators (NOT the denominators)
4. Reduce/change to a mixed number.

To subtract fractions: 1. find common denominator.

2. Subtract the numerator
3. Reduce/change to a mixed number.

2 options for reducing Fractions

1. Find a whole # by
dividing numer. by $\frac{120}{35}$
denom. $3 \text{ r } 15$
 $3 \times 35 = 105$

The remainder is the
new numerator

2. Reduce by dividing out
common factors

$$3 \frac{15}{35} \div 5$$

$$3 \frac{3}{7}$$

Multiplying Fractions - convert mixed fractions to improper fractions.
 Multiply straight across: numerator x numerator, denominator x denominator. Simplify as necessary.

Practice 7-4

To convert MIXED FRACTIONS (with a whole number and fraction) to IMPROPER fractions (with a higher number on top):

1. Multiply the denominator times the whole number.

$$4 \frac{7}{16} \quad 16 \times 4 = 64$$

2. Add the numerator on to the product you just found. The result is the "new numerator" for the improper fraction

$$7 + 64 = 71 \quad \frac{71}{16}$$

6. $\frac{4}{9} \times \frac{3}{4}$

10. $\frac{4}{5} \times \frac{5}{14}$

11. $\frac{1}{4} \times \frac{5}{8}$

13. $\frac{4}{5} \times 7$

14. $2\frac{2}{5} \times 1\frac{3}{7}$

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

$$\frac{12}{5} \times \frac{10}{7}$$

$$\frac{120}{35}$$

multiplying fractions

multiply numerators straight
across

Multiply denominators straight
across

$$\frac{3}{4} \times \frac{4}{5} = \frac{12}{20} \frac{6}{10} \left(\frac{3}{5} \right)$$

To multiply MIXED NUMBER Fractions

$2\frac{1}{2} \times \frac{3}{5}$ Convert
...mixed # fractions to improper fractions,
then multiply as normal

$$\frac{5}{2} \times \frac{3}{5} = \frac{15}{10} \quad \frac{3}{2} = 1\frac{1}{2}$$

Dividing Fractions

Ex: 12 from 5.6.

$$3\frac{1}{3} \div \frac{2}{9}$$

1. Change mixed number fractions to improper fractions. $3\frac{1}{3} = \frac{10}{3}$

2. "Flip" the second fraction (this flipped fraction is called the reciprocal) $\frac{9}{2}$

3. **Multiply** the fractions as you normally would.

$$\frac{10}{3} \times \frac{9}{2} = \frac{90}{6} = 15$$

example of cross reduction

$$\begin{array}{c} 5 \\ \frac{10}{3} \end{array} \times \begin{array}{c} 9 \\ \frac{2}{1} \end{array} \begin{array}{c} 3 \\ \\ \end{array} \quad 5 \times 3 = 15$$