GRADE 5 – MODULE 3: PARENT GUIDE

Addition and Subtraction of Fractions

- Each day in class, we do practice sets. Attached are the answer keys to the Practice Sets from this module. These answer keys can be used to refresh your child's memory of work we did together in class and help you support your child with the math homework. There is a footer at the end of each answer key that tells you the lesson number. This lesson number corresponds with the lesson number on the homework sheets.

Module 3 Contents:

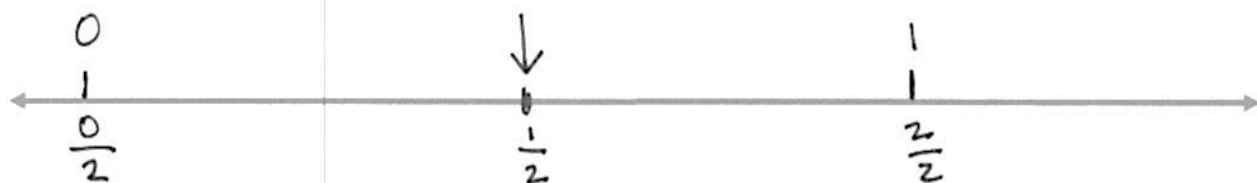|	
Topic A	Lessons 1 - 2
Topic B	Lessons 3 – 7
Topic C	Lessons 8 – 12
Topic D	Lessons 13 – 16

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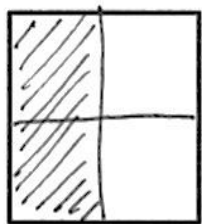## Lesson #1: Activity Sheet: Equivalent Fractions

1. Use your folded paper strip to mark the points 0 and 1 above the number line $\frac{0}{2}, \frac{1}{2}, \frac{2}{2}$ below.

$$0 \qquad\qquad \downarrow \qquad\qquad 1$$

$$\frac{0}{2} \qquad\qquad \frac{1}{2} \qquad\qquad \frac{2}{2}$$

Draw one vertical I line down the middle of each rectangle. Shade the left half of each. Partition with horizontal lines to show the equivalent fractions $\frac{2}{4}, \frac{3}{6}, \frac{4}{8}, \frac{5}{10}$. Use multiplication to show the change in the units.
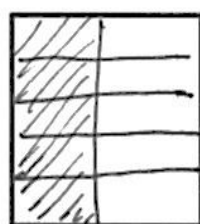
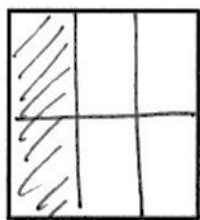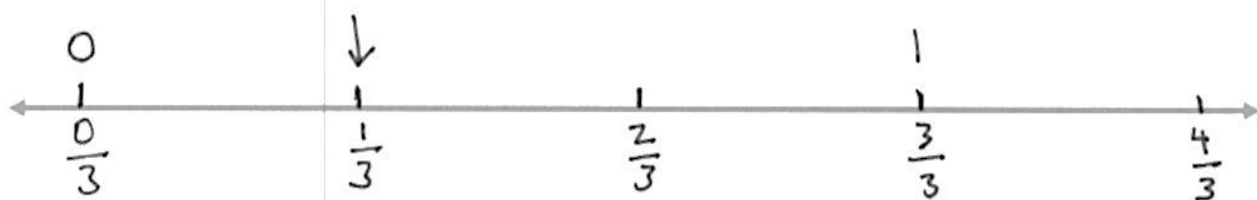$$\frac{1}{2} = \frac{1 \times 2}{2 \times 2} = \frac{2}{4} \qquad \frac{1}{2} = \frac{1 \times 3}{2 \times 3} = \frac{3}{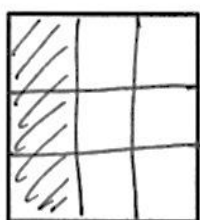6} \qquad \frac{1}{2} = \frac{1 \times 4}{2 \times 4} = \frac{4}{8} \qquad \frac{1}{2} = \frac{1 \times 5}{2 \times 5}$$

2. Use your folded paper strip to mark the points 0 and 1 above the number line $\frac{0}{3}, \frac{1}{3}, \frac{2}{3}, \frac{3}{3}$ below.
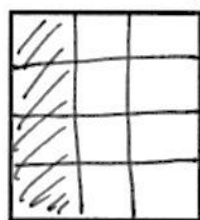   Follow the same pattern as question #1 but with thirds.

$$0 \qquad \downarrow \qquad\qquad 1$$

$$\frac{0}{3} \qquad \frac{1}{3} \qquad \frac{2}{3} \qquad \frac{3}{3} \qquad \frac{4}{3}$$

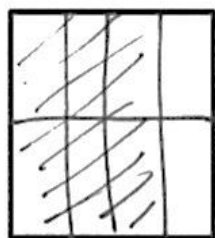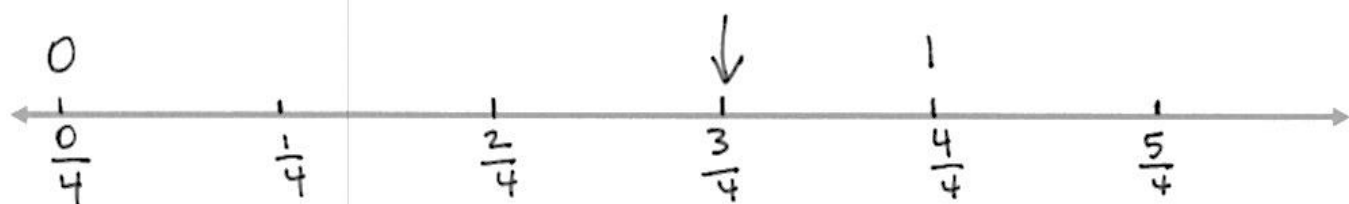$$\frac{1}{3} = \frac{1 \times 2}{3 \times 2} = \frac{2}{6} \qquad \frac{1}{3} = \frac{1 \times 3}{3 \times 3} = \frac{3}{9} \qquad \frac{1}{3} = \frac{2 \times 4}{3 \times 4} = \frac{8}{12} \qquad \frac{1}{3} = \frac{1 \times 5}{3 \times 5}$$

3. Continue the pattern with 3 fourths.

$$\frac{0}{4} \quad \frac{1}{4} \quad \frac{2}{4} \quad \frac{3}{4} \quad \frac{4}{4} \quad \frac{5}{4}$$

$$\frac{3}{4} = \frac{3 \times 2}{4 \times 2}$$
$$= \frac{6}{8}$$

$$\frac{3}{4} = \frac{3 \times 3}{4 \times 3}$$
$$= \frac{9}{12}$$
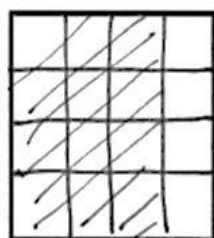
$$\frac{3}{4} = \frac{3 \times 4}{4 \times 4}$$
$$= \frac{12}{16}$$

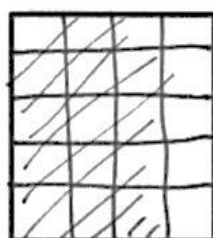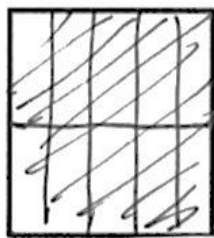$$\frac{3}{4} = \frac{3 \times 5}{4 \times 5}$$
$$= \frac{15}{20}$$

4. Continue the process with 6 fifths. Just do 2 examples.

$$\frac{0}{5} \quad \frac{1}{5} \quad \frac{2}{5} \quad \frac{3}{5} \quad \frac{4}{5} \quad \frac{5}{5} \quad \frac{6}{5} \quad \frac{7}{5}$$
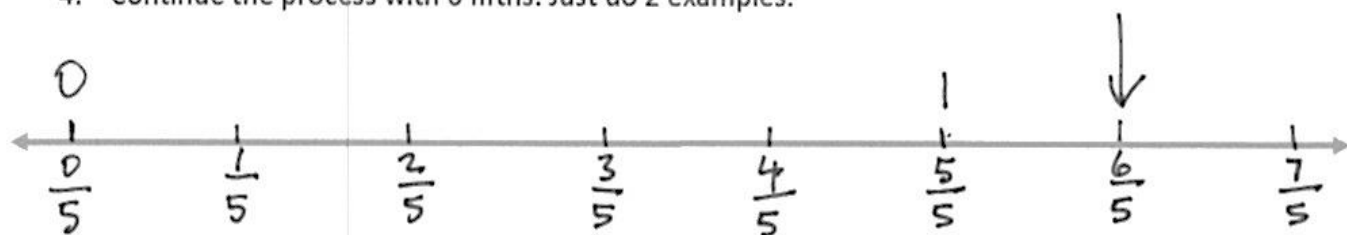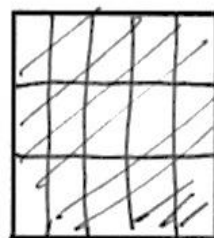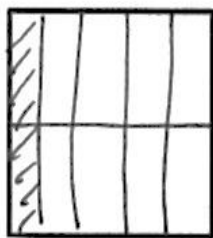
$$\frac{6}{5} = \frac{6 \times 2}{5 \times 2} = \frac{12}{10}$$

$$\frac{6}{5} = \frac{6 \times 3}{5 \times 3} = \frac{18}{15}$$
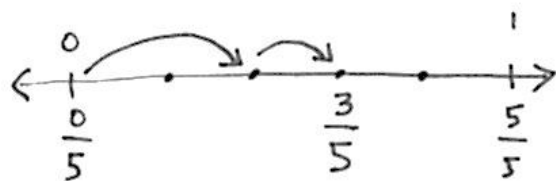
2
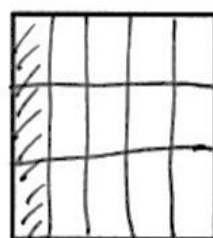
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Lesson 2 Activity Sheet: Making Equivalent Fractions with Sums of Fractions with Like Denominators

1) Show each expression on a number line. Solve.

a) $\frac{2}{5} + \frac{1}{5} = \frac{3}{5}$

b) $\frac{1}{3} + \frac{1}{3} + \frac{1}{3} = \frac{3}{3}$
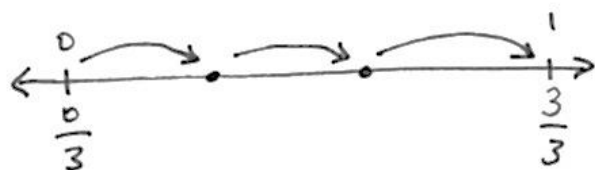
c) $\frac{3}{10} + \frac{3}{10} + \frac{3}{10} = \frac{9}{10}$
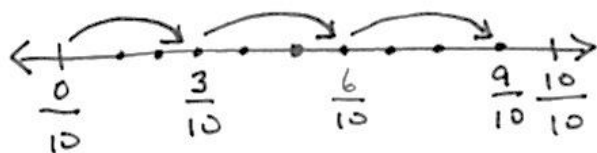
d) $2 \times \frac{3}{4} + \frac{1}{4} = \frac{7}{4} = 1 + \frac{3}{4} = 1\frac{3}{4}$
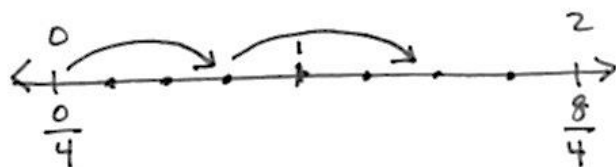
2) Express each fraction as the sum of two or three equal fractional parts. Rewrite each as a multiplication equation. Show letter a on a number line.

a) $\frac{6}{7} = \frac{3}{7} + \frac{3}{7} = 2 \times \frac{3}{7}$
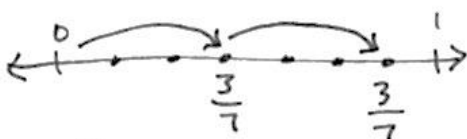
b) $\frac{9}{2} = \frac{3}{2} + \frac{3}{2} + \frac{3}{2} = 3 \times \frac{3}{2}$

c) $\frac{12}{10} = \frac{4}{10} + \frac{4}{10} + \frac{4}{10}$

$= 3 \times \frac{4}{10}$

d) $\frac{27}{5} = \frac{9}{5} + \frac{9}{5} + \frac{9}{5}$

$= 3 \times \frac{9}{5}$

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3) Express each of the following as the sum of a whole number and a fraction. Show c and d on number lines.

a) $\frac{9}{7} = \frac{7}{7} + \frac{2}{7} = 1 + \frac{2}{7}$

b) $\frac{9}{2} = 3 \times \frac{2}{2} + \frac{1}{2} = 3\frac{1}{2}$

c) $\frac{32}{7} = \frac{28}{7} + \frac{4}{7} = 4 + \frac{4}{7}$

d) $\frac{24}{9} = \frac{18}{9} + \frac{6}{9} = 2\frac{6}{9}$

4) Marisela cut four equivalent lengths of ribbon. Each was 5 eighths of a yard long. How many yards of ribbon did she cut? Express your answer as the sum of a whole number and the remaining fractional units. Draw a number line to represent the problem.

$$4 \times \frac{5}{8} = \frac{20}{8} = \frac{16}{8} + \frac{4}{8} = 2 + \frac{4}{8}$$
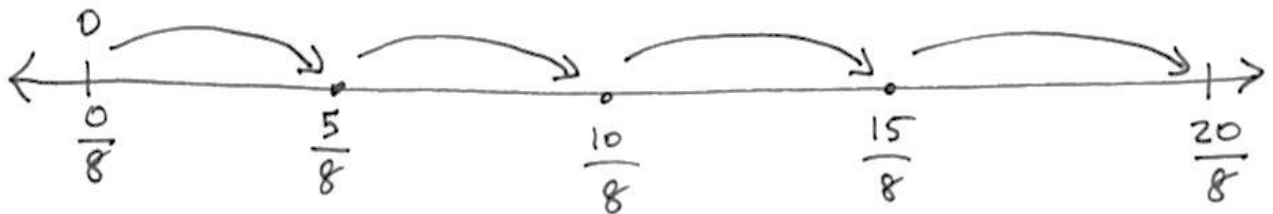
Marisela's ribbon was $2\frac{4}{8}$ yards long.

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1. For the following problems, draw a picture using the rectangular fraction model and write the answer. Simplify your answer.

a) $\frac{1}{2} + \frac{1}{3} = \frac{3}{6} + \frac{2}{6} = \frac{5}{6}$
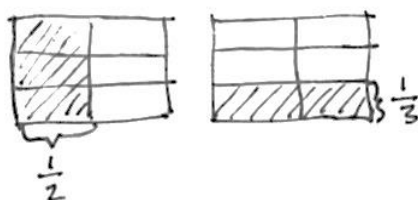
b) $\frac{1}{3} + \frac{1}{5} = \frac{5}{15} + \frac{4}{15} = \frac{9}{15}$
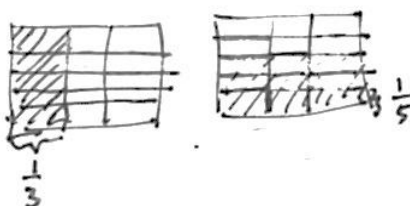
c) $\frac{1}{4} + \frac{1}{3} = \frac{3}{12} + \frac{4}{12} = \frac{7}{12}$

d) $\frac{1}{3} + \frac{1}{7} = \frac{7}{21} + \frac{3}{21} = \frac{10}{21}$
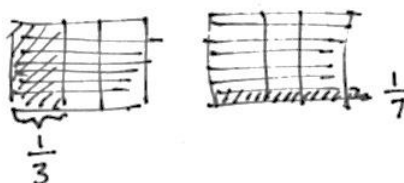
e) $\frac{3}{4} + \frac{1}{5} = \frac{15}{20} + \frac{4}{20} = \frac{19}{20}$

f) $\frac{2}{3} + \frac{2}{7} = \frac{14}{21} + \frac{6}{21} = \frac{20}{21}$
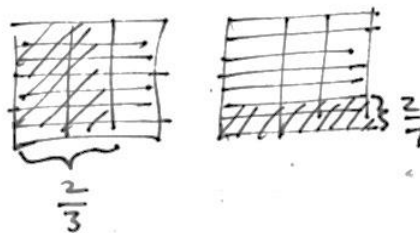
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Solve the following problems. Draw a picture and/or write the number sentence that proves the answer. Simplify your answer.

2. Jamal used 1/3 yard of ribbon to tie a package and 1/6 yard of ribbon to tie a bow. How many yards of ribbon did Jamal use?

$$\frac{1}{3} + \frac{1}{6} = \frac{6}{18} + \frac{3}{18} = \frac{9}{18}$$
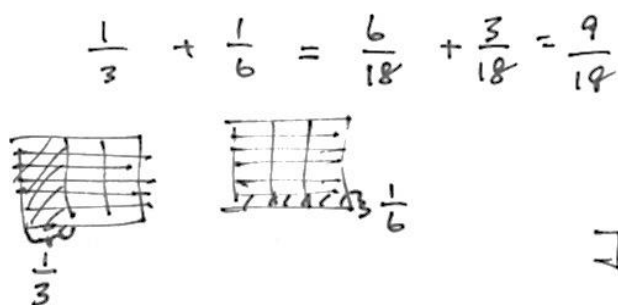
Jamal used $\frac{9}{18}$ yard of ribbon or $\frac{1}{2}$ yard.

3. Over the weekend, Nolan drank 1/6 quart of orange juice, and Andrea drank 3/4 quart of orange juice. How many quarts did they drink together?
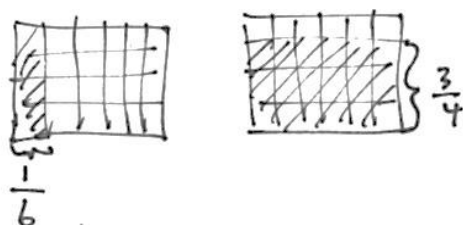
They drank $\frac{11}{12}$ quart together.

$$\frac{4}{24} + \frac{18}{24} = \frac{22}{24} = \frac{11 \times 2}{12 \times 2}$$

4. Nadia spent 1/4 of her money on a shirt and 2/5 of her money on new shoes. What fraction of Nadia's money has been spent? What fraction of her money is left?
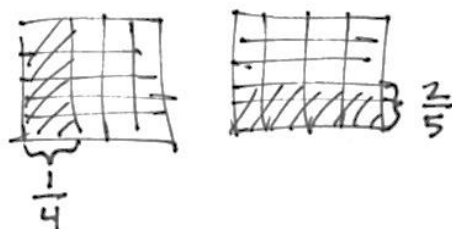
She spent $\frac{13}{20}$ and $\frac{7}{20}$ was left.

$$= \frac{5}{20} + \frac{8}{20} = \frac{13}{20}$$

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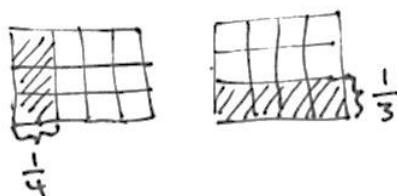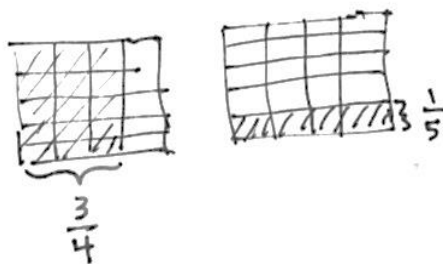1) For the following problems, draw a picture using the rectangular fraction model and write the answer. When possible, write your answer as a mixed number.

a) $\frac{2}{3} + \frac{1}{2} = \frac{4}{6} + \frac{3}{6} = \frac{7}{6} = 1\frac{1}{6}$

$\frac{6}{6} \quad \frac{1}{6}$

$\frac{1}{2}$

$\frac{2}{3}$

b) $\frac{3}{4} + \frac{2}{3} = \frac{9}{12} + \frac{8}{12} = \frac{17}{12} = 1\frac{5}{12}$

$\frac{12}{12} \quad \frac{5}{12}$

$\frac{2}{3}$

$\frac{3}{4}$

c) $\frac{1}{2} + \frac{3}{5} = \frac{5}{10} + \frac{6}{10} = \frac{11}{10} = 1\frac{1}{10}$

$\frac{10}{10} \quad \frac{1}{10}$

$\frac{3}{5}$

$\frac{1}{2}$

d) $\frac{5}{7} + \frac{1}{2} = \frac{10}{14} + \frac{7}{14} = \frac{17}{14} = 1\frac{3}{14}$

$\frac{14}{14} \quad \frac{3}{14}$

$\frac{1}{2}$

$\frac{5}{7}$
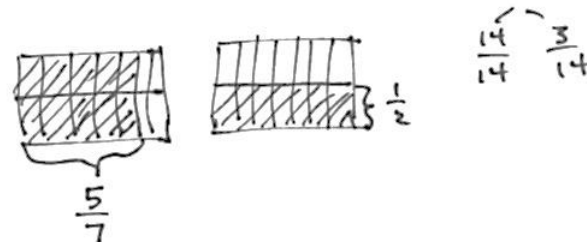
e) $\frac{3}{4} + \frac{5}{6} = \frac{18}{24} + \frac{20}{24} = \frac{38}{24} = 1\frac{14}{24}$

$\frac{24}{24} \quad \frac{14}{24}$

$\frac{5}{6}$

$\frac{3}{4}$
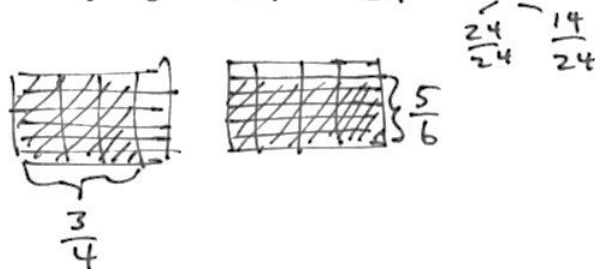
f) $\frac{2}{3} + \frac{3}{7} = \frac{14}{21} + \frac{9}{21} = \frac{23}{21} = 1\frac{2}{21}$
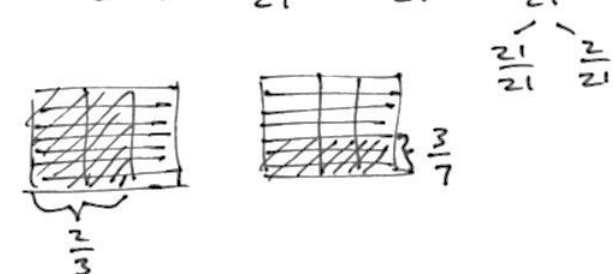
$\frac{21}{21} \quad \frac{2}{21}$

$\frac{3}{7}$

$\frac{2}{3}$

Solve the following problems. Draw a picture and/or write the number sentence that proves the answer. Simplify your answer.

2) Penny used 2/5 lb of flour to bake a vanilla cake. She used another 3/4 lb of flour to bake a chocolate cake. How much flour did she use altogether?
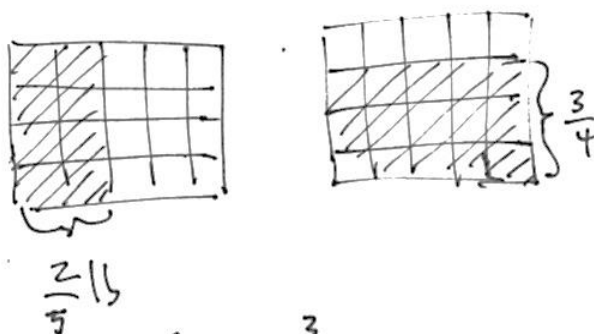
$$\frac{2}{5} + \frac{3}{4}$$

$$= \frac{8}{20} + \frac{15}{20} = \frac{23}{20} = 1\frac{3}{20}$$

$$\frac{20}{20} \quad \frac{3}{20}$$

Penny used $1\frac{3}{20}$ pounds of flour to bake her cakes.

3) Carlos wants to practice piano 2 hours each day. He practices piano for 3/4 hour before school and 7/10 hour when he gets home. How many hours has Carlos practiced piano? How much longer does he need to practice before going to bed in order to meet his goal?
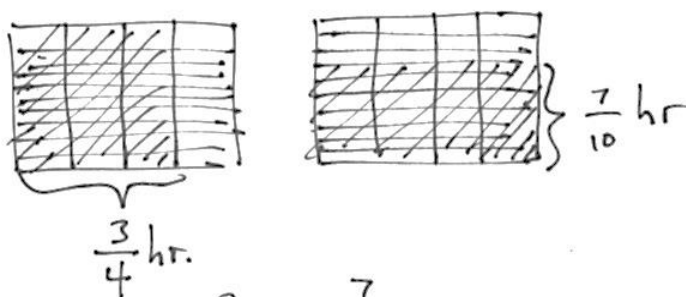
$$\frac{3}{4} + \frac{7}{10}$$

$$= \frac{30}{40} + \frac{28}{40} = \frac{58}{40} = 1\frac{18}{40} = 1\frac{9}{20}$$

$$\frac{40}{40} \quad \frac{18}{40}$$

Carlos has practiced $1\frac{9}{20}$ hrs and has $\frac{11}{20}$ hour to go to make his goal.
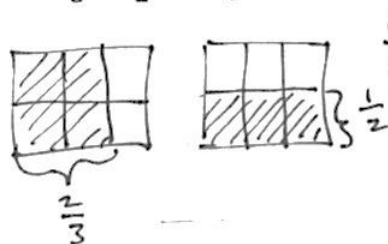
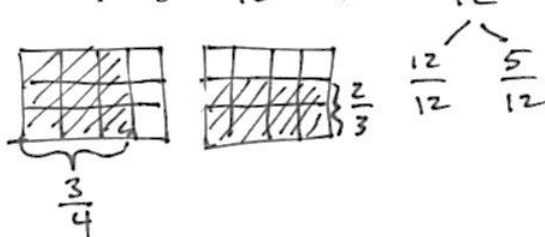$$1\frac{9}{20} + \frac{11}{20} = 2 \text{ hours}$$

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1) For the following problems, draw a picture using the rectangular fraction model and write the answer. Simplify your answer.
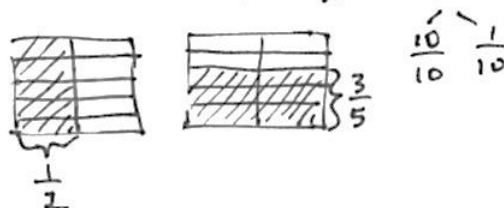
a) $\frac{1}{3} - \frac{1}{4} = \frac{4}{12} - \frac{3}{12} = \frac{1}{12}$

$\frac{1}{4}$

$\frac{1}{3}$

b) $\frac{2}{3} - \frac{1}{2} = \frac{4}{6} - \frac{3}{6} = \frac{1}{6}$

$\frac{1}{2}$

$\frac{2}{3}$
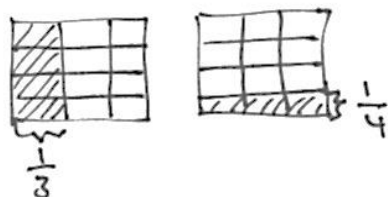
c) $\frac{5}{6} - \frac{1}{4} = \frac{20}{24} - \frac{6}{24} = \frac{14}{24}$

$\frac{1}{4}$

$\frac{5}{6}$

d) $\frac{2}{3} - \frac{1}{7} = \frac{14}{21} - \frac{3}{21} = \frac{11}{21}$

$\frac{1}{7}$

$\frac{2}{3}$
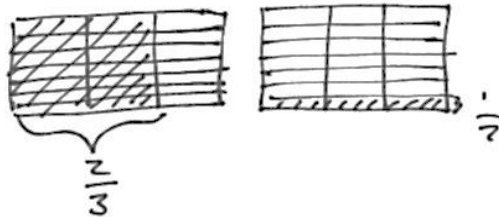
e) $\frac{3}{4} - \frac{3}{8} = \frac{24}{32} - \frac{12}{32} = \frac{12}{32}$

$\frac{3}{8}$

$\frac{3}{4}$
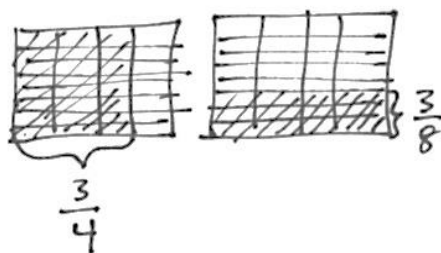
f) $\frac{3}{4} - \frac{2}{7} = \frac{21}{28} - \frac{8}{28} = \frac{13}{28}$

$\frac{2}{7}$

$\frac{3}{4}$
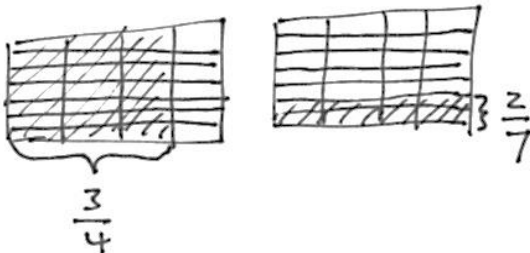
2) Mr. Penman had 2/3 liter of salt water. He used 1/5 of a liter for an experiment. How much salt water does Mr. Penman have left?
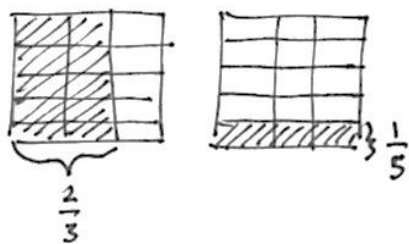
$\frac{2}{3} - \frac{1}{5}$

$= \frac{10}{15} - \frac{3}{15} = \frac{7}{15}$

Mr. Penman has $\frac{7}{15}$ liter left.

3) Sandra says that $\frac{4}{7} - \frac{1}{3} = \frac{3}{4}$ because all you have to do is subtract the numerators and subtract the denominators. Convince Sandra that she is wrong. You may draw a rectangular fraction model to help.

Sandra, you are wrong!! The units aren't the same. $\frac{3}{4}$ is only $\frac{1}{4}$ away from 1 whole.

$\frac{4}{7}$ is $\frac{3}{7}$ away from 1 whole.

That means your answer is impossible because your answer got bigger after you took away one third. Make both fractions into the same units

$\frac{4}{7} - \frac{1}{3} = \frac{12}{21} - \frac{7}{21} = \frac{5}{21}$

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Lesson 5:
Date:

Subtract Fractions with Unlike Units Using the Strategy of Creating Equivalent Fractions
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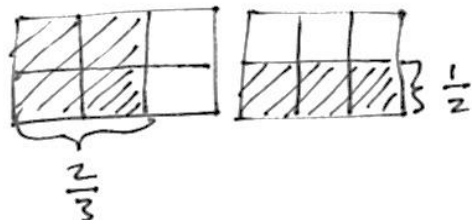
For the following problems, draw a picture using the rectangular fraction model and write the answer. Simplify your answer.
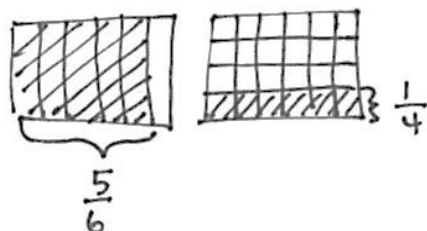
a) $1\frac{1}{4} - \frac{1}{3} = \frac{15}{12} - \frac{4}{12} = \frac{11}{12}$

$1\frac{1}{4} = \frac{15}{12}$
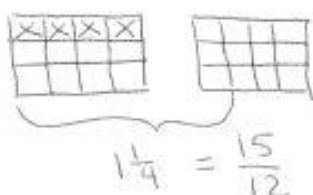
b) $1\frac{1}{5} - \frac{1}{3} = \frac{18}{15} - \frac{5}{15} = \frac{13}{15}$

$1\frac{1}{5} = \frac{18}{15}$
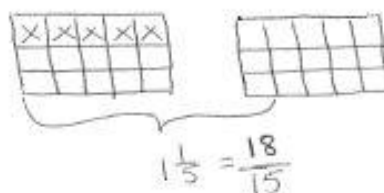
c) $1\frac{3}{8} - \frac{1}{2} = \frac{22}{16} - \frac{8}{16} = \frac{14}{16} = \frac{7}{8}$

$1\frac{3}{8} = \frac{22}{16}$
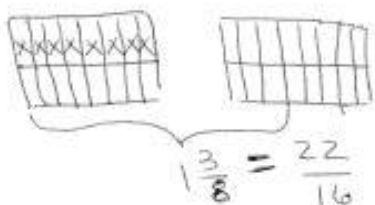
d) $1\frac{2}{5} - \frac{1}{2} = \frac{14}{10} - \frac{5}{10} = \frac{9}{10}$

$1\frac{2}{5} = \frac{14}{10}$
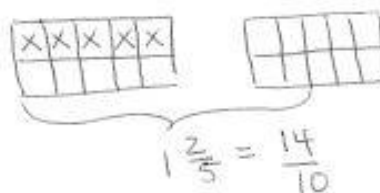
e) $1\frac{2}{7} - \frac{1}{3} = \frac{27}{21} - \frac{7}{21} = \frac{20}{21}$

$1\frac{2}{7} = \frac{27}{21}$

f) $1\frac{2}{3} - \frac{3}{5} = \frac{25}{15} - \frac{9}{15} = \frac{16}{15}$

$1\frac{2}{3} = \frac{25}{15}$

COMMON CORE | Lesson 5:   Subtract Fractions with Unlike Units Using the Strategy of Creating Equivalent Fractions   **engage**^ny   3.B.55

Date: 6/26/13

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11
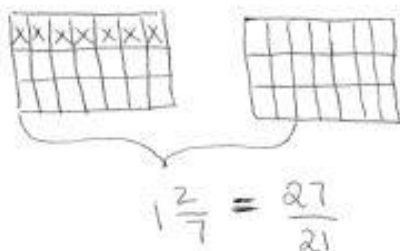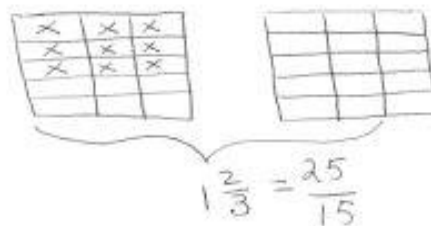
2) Jean-Luc jogged around the lake in 1 1/4 hour. William jogged the same distance in 5/6 hour. How much longer did Jean-Luc take than William in hours? How many more minutes?
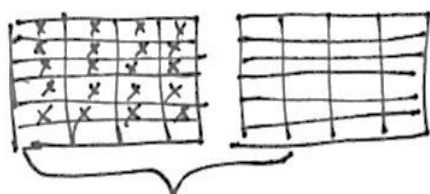
$$\frac{30}{24} - \frac{20}{24} = \frac{10}{24} = \frac{5 \times 2}{12 \times 2}$$

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

$$1\frac{1}{4} = \frac{30}{24}$$

Jean Luc jogged $\frac{5}{12}$ hour more.

3) Is it true that $1\frac{2}{5} - \frac{3}{4} = \frac{1}{4} + \frac{2}{5}$? Prove your answer.

Yes. It is true
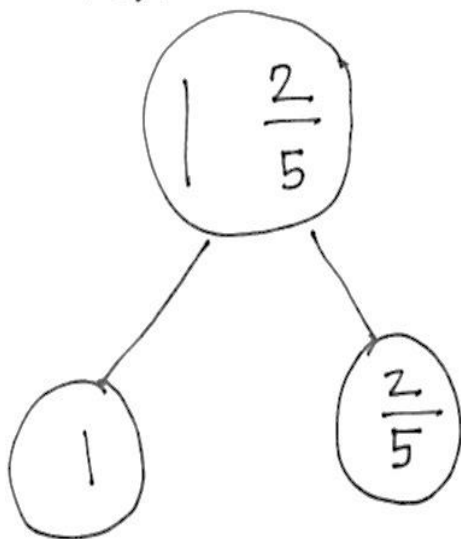
Take $\frac{3}{4}$ from 1 whole.
That means $1 - \frac{3}{4} = \frac{1}{4}$
Add that to $\frac{2}{5}$.
The answer is the sum of $\frac{1}{4}$ and $\frac{2}{5}$.
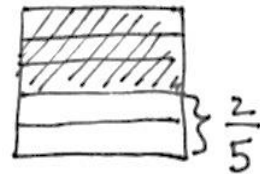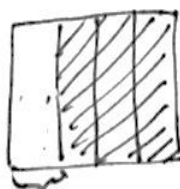
Problem 1

George weeded 1/5 of the garden, and Summer weeded some, too. When they were finished, 2/3 of the garden still needed to be weeded. What fraction of the garden did Summer weed?
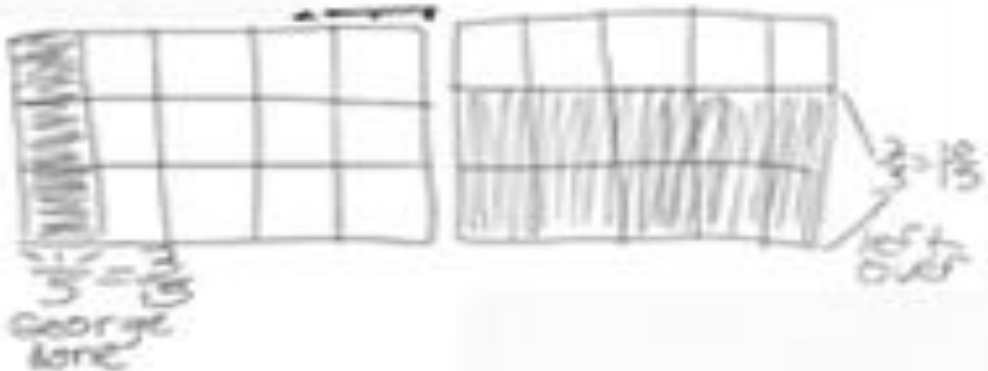
the garden

$$\frac{1}{5} \quad \frac{2}{3} \quad ?$$

George left Summer

$$1 - \frac{1}{5} - \frac{2}{3} =$$

$$= \frac{4}{5} - \frac{2}{3}$$

$$= \frac{12}{15} - \frac{10}{15}$$

$$= \frac{2}{15}$$

Summer weeded $\frac{2}{15}$ of the garden.

COMMON CORE | Lesson 7: | Solve two-step word problems.
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$$\frac{1}{5} + \frac{2}{3} =$$

$$= \frac{3}{15} + \frac{10}{15}$$

$$= \frac{13}{15}$$

$$1 - \frac{13}{15} = \frac{2}{15}$$

Summer weeded $\frac{2}{15}$ of the garden.

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Problem 2

Jing spent 1/3 of her money on a pack of pens, 1/2 of her money on a pack of markers, and 1/8 of her money on a pack of pencils.

What fraction of her money is left?

All her money

$$\frac{1}{3} \quad \frac{1}{2} \quad \frac{1}{8}$$

pens $\frac{1}{2}$ pencils ? left

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

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

$$= \frac{2}{3} - \frac{5}{8}$$

$$= \frac{16}{24} - \frac{15}{24}$$

$$= \frac{1}{24}$$

Jing had $\frac{1}{24}$ of her money left.

$$\frac{1}{3} = \frac{8}{24}$$

$$\frac{1}{2} = \frac{12}{24}$$

$$\frac{1}{3} + \frac{1}{2} + \frac{1}{8}$$

$$= \frac{8}{24} + \frac{12}{24} + \frac{3}{24}$$

$$= \frac{23}{24}$$

$$\frac{24}{24} - \frac{23}{24} = \frac{1}{24}$$

Jing had $\frac{1}{24}$ of her money left.

COMMON CORE   Lesson 7:   Solve two-step word problems.
                Date: 11/12/13

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Problem 3

Shelby bought a 2 ounce tube of blue paint. She used 2/3 ounce to paint the water, 3/5 ounce to paint the sky, and some to paint a flag. After that she has 2/15 ounce left. How much paint did Shelby use to paint her flag?

$$\frac{1}{3} + \frac{4}{15} = \frac{5}{15} + \frac{4}{15} = \frac{9}{15}$$

Shelby used $\frac{9}{15}$ ounce to paint the flag.

$$\frac{10}{15} + \frac{9}{15} + \frac{2}{15}$$

$$= \frac{21}{15} = 1\frac{6}{15}$$

$$2 - 1\frac{6}{15} = \frac{9}{15}$$

Shelby used $\frac{9}{15}$ ounce to paint the flag.

She used $\frac{9}{30}$ tube or $\frac{3}{10}$ tube to paint the flag.
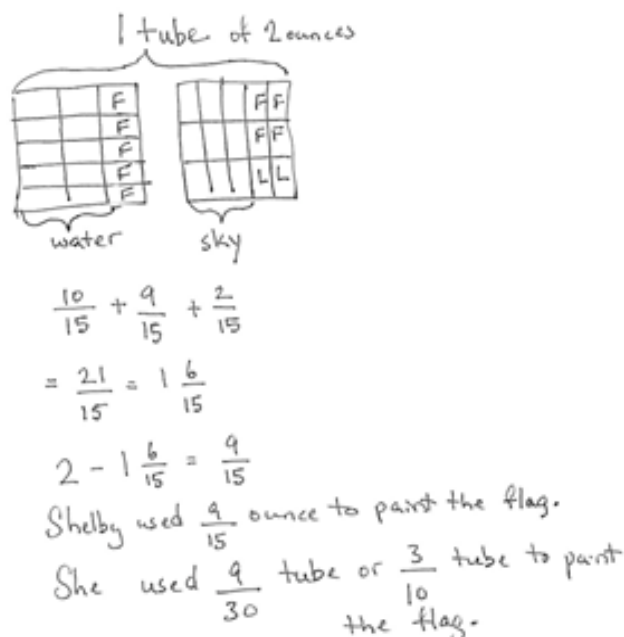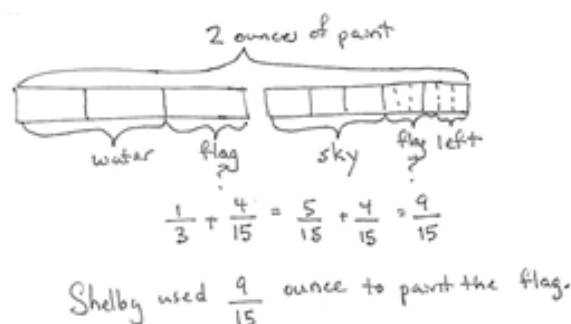
Problem 4

Jim sold 3/4 gallon of lemonade. Dwight sold some lemonade too. Together, they sold 1 5/12 gallons. Who sold more lemonade, Jim or Dwight? How much more? (See the lesson debrief for student work samples.)

Problem 5

Leonard spent 1/4 of his money on a sandwich. He spent 2 times as much on a gift for his brother as on some comic books. He had 3/8 of his money left. What fraction of his money did he spend on the comic books?

$$1 - \frac{7}{8} = \frac{1}{8}$$

Leonard spent $\frac{1}{8}$ of his money on comics.

Leonard spent $\frac{1}{8}$ his money on comics.

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5•3
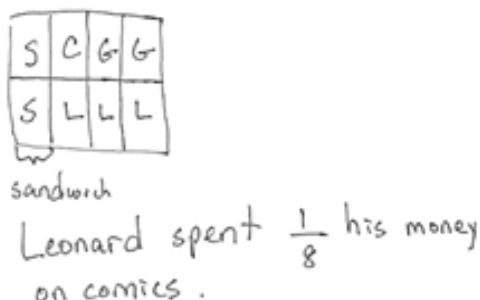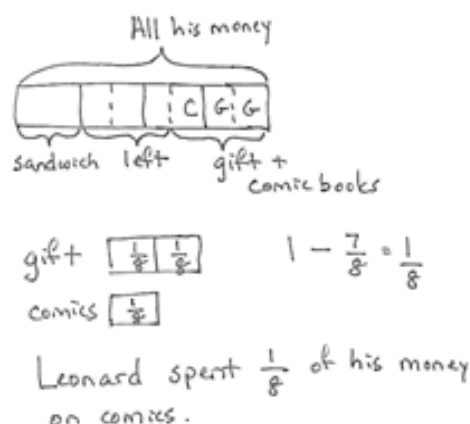
Name *Jennifer*   Date *November 4, 2012*

1) Add or Subtract.

a) $2 + 1\frac{1}{5} = \boxed{3\frac{1}{5}}$
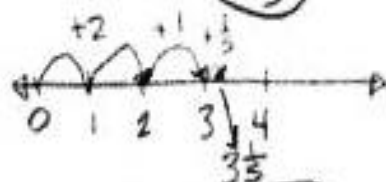
b) $2 - 1\frac{3}{8} = \boxed{\frac{5}{8}}$
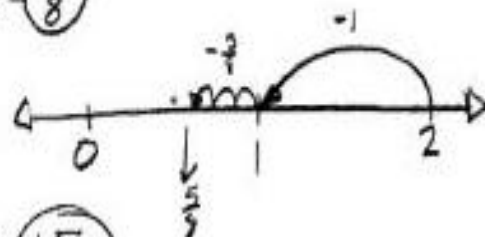
c) $5\frac{2}{5} + 2\frac{3}{5} = \boxed{8}$
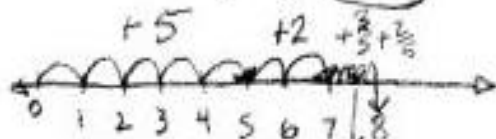
d) $4 - 2\frac{2}{7} = \boxed{1\frac{5}{7}}$
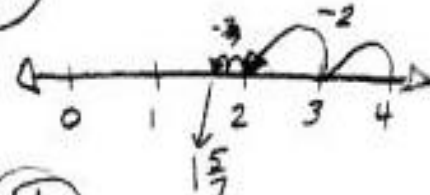
e) $9\frac{3}{4} + 8 = \boxed{17\frac{3}{4}}$
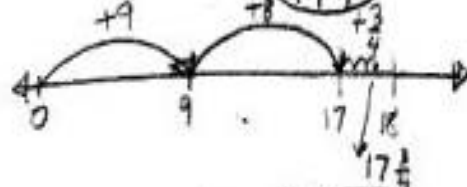
f) $17 - 15\frac{2}{3} = \boxed{1\frac{1}{3}}$
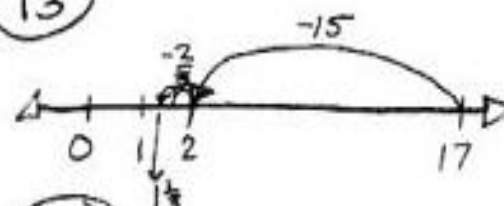
g) $15 + 17\frac{2}{3} = \boxed{32\frac{2}{3}}$
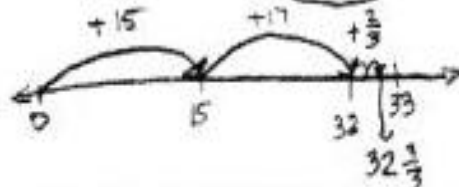
h) $100 - 20\frac{7}{8} = \boxed{79\frac{1}{8}}$
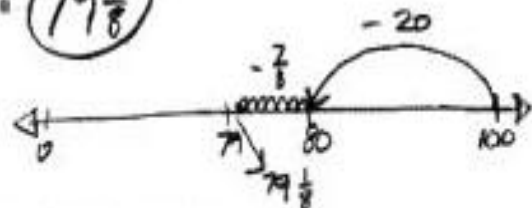
2) Calvin had 30 minutes in time-out. For the first 23 1/3 minutes Calvin counted spots on the ceiling. For the rest of the time he made faces at his stuffed tiger. How long did Calvin spend making faces at his tiger?

$$30 - 23\frac{1}{3} = 6\frac{2}{3}$$

Calvin spent $6\frac{2}{3}$ minutes making faces at his tiger.
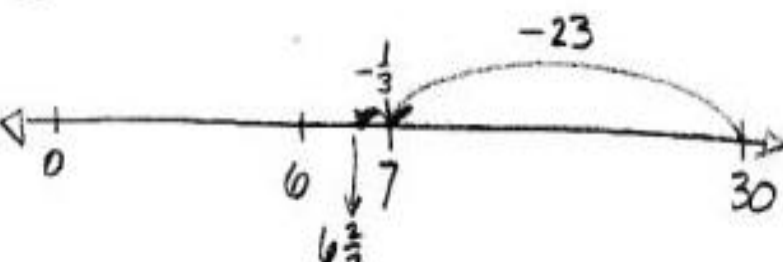
3) Linda planned to spend 9 hours practicing piano this week. By Tuesday, she had spent 2 ½ hours practicing. How much longer does she need to practice to reach her goal?

$$-\frac{1}{2} \qquad -2$$

6 7 8 9

$6\frac{1}{2}$
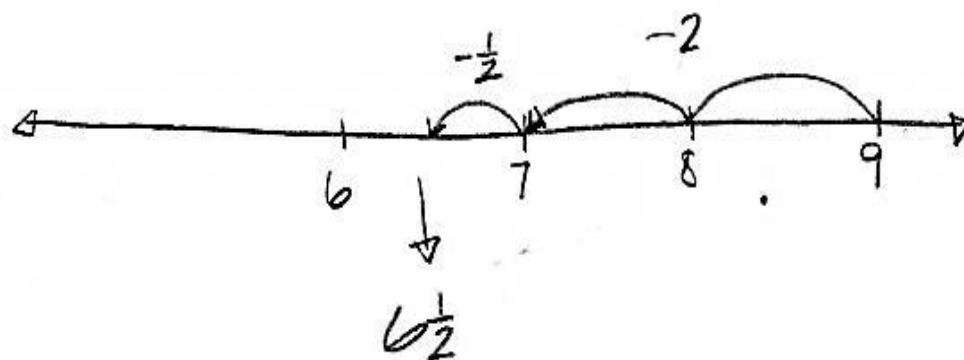
Linda needs to spend $6\frac{1}{2}$ hours more to reach her goal.

4) Gary says that $3 - 1\frac{1}{3}$ will be more than 2, since $3 - 1$ is 2. Draw a picture to prove that Gary is wrong.

$$-\frac{1}{3} \qquad -1$$

0 1 2 3

$1\frac{2}{3}$
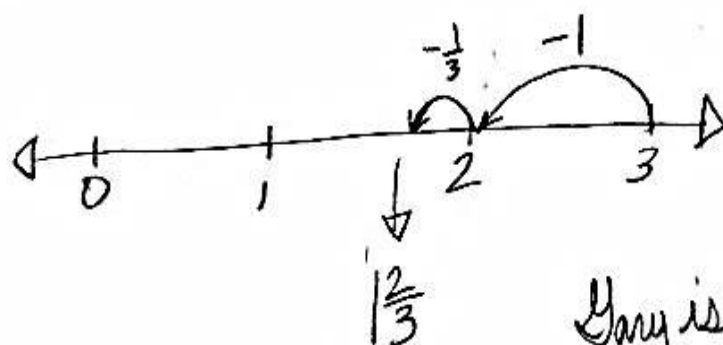
Gary is wrong!
He estimated that $3-1\frac{1}{3}$
would be more than 2, but
he forgot that subtracting
$\frac{1}{3}$ more will make the answer
less than 2.

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Name _Callie_ Date _11/13_

1) First make like uncits. Then add.

a) $\frac{3}{4} + \frac{1}{7} = \left(\frac{3\times7}{4\times7}\right) + \left(\frac{1\times4}{7\times4}\right)$

$= \frac{21}{28} + \frac{4}{28}$

$= \frac{25}{28}$

b) $\frac{1}{4} + \frac{9}{8} = \left(\frac{1\times8}{4\times8}\right) + \left(\frac{9\times4}{8\times4}\right)$

$= \frac{8}{32} + \frac{36}{32}$

$= \frac{44}{32}$

$= \frac{32}{32} + \frac{12}{32} = 1\frac{12}{32} = 1\frac{3}{8}$

c) $\frac{3}{8} + \frac{3}{7} = \left(\frac{3\times7}{8\times7}\right) + \left(\frac{3\times8}{7\times8}\right)$

$= \frac{21}{56} + \frac{24}{56}$

$= \frac{45}{56}$

d) $\frac{4}{9} + \frac{4}{7} = \left(\frac{4\times7}{9\times7}\right) + \left(\frac{4\times9}{7\times9}\right)$

$= \frac{28}{63} + \frac{36}{63}$

$= \frac{64}{63} = \frac{63}{63} + \frac{1}{63} = 1\frac{1}{63}$

e) $\frac{1}{5} + \frac{2}{3} = \left(\frac{1\times3}{5\times3}\right) + \left(\frac{2\times5}{3\times5}\right)$

$= \frac{3}{15} + \frac{10}{15}$

$= \frac{13}{15}$

f) $\frac{3}{4} + \frac{5}{6} = \left(\frac{3\times3}{4\times3}\right) + \left(\frac{5\times2}{6\times2}\right)$

$= \frac{9}{12} + \frac{10}{12}$

$= \frac{19}{12} = \frac{12}{12} + \frac{7}{12} = 1\frac{7}{12}$

g) $\frac{2}{3} + \frac{1}{11} = \left(\frac{2\times11}{3\times11}\right) + \left(\frac{1\times3}{11\times3}\right)$

$= \frac{22}{33} + \frac{3}{33}$

$= \frac{25}{33}$

h) $\frac{3}{4} + 1\frac{1}{10} = 1 + \left(\frac{3\times5}{4\times5}\right) + \left(\frac{1\times2}{10\times2}\right)$

$= 1 + \frac{15}{20} + \frac{2}{20}$

$= 1\frac{17}{20}$

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2) Whitney says that to add fractions with different denominators, you always have to multiply the denominators to find the common unit, for example:

$$\frac{1}{4} + \frac{1}{6} = \frac{6}{24} + \frac{4}{24}$$

Show Whitney how she could have chosen a denominator smaller than 24, and solve the problem.

4: 4, 8, (12), 16, 20, (24)
6: 6, (12), 18, (24)

12 and 24 are both multiples of 4 and 6. 12 is a larger unit and gives me the answer faster.

$$\frac{1}{4} + \frac{1}{6} = \left(\frac{1}{4} \times \frac{3}{3}\right) + \left(\frac{1}{6} \times \frac{2}{2}\right)$$

$$= \frac{3}{12} + \frac{2}{12}$$

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

or

$$\frac{1}{4} + \frac{1}{6} = \frac{6}{12} + \frac{4}{12}$$

$$= \frac{10}{24}$$

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

3) Jackie brought ¾ of a gallon of iced tea to the party. Bill brought 7/8 of a gallon of iced tea to the same party. How much iced tea did Jackie and Bill bring to the party?

$$\frac{3}{4} + \frac{7}{8} = \left(\frac{3}{4} \times \frac{4}{4}\right) + \left(\frac{7}{8} \times \frac{2}{2}\right)$$

$$= \frac{12}{16} + \frac{14}{16}$$

$$= \frac{26}{16}$$

$$= \frac{16}{16} + \frac{10}{16} \Rightarrow 1\frac{10}{16} \text{ gallons or } 1\frac{5}{8} \text{ gallons}$$

Jackie and Bill brought $1\frac{5}{8}$ gallons of iced tea.

4) Madame Curie made some radium in her lab. She used 2/5 kg of the radium in an experiment and had 1 ¼ kg left. How much radium did she have at first? (Bonus: If she performed the experiment twice, how much radium would she have left?)

$\frac{2}{5}$ kg $1\frac{1}{4}$ kg

Bonus:

$$\frac{1}{4} - \frac{2}{5} = \frac{5}{4} - \frac{2}{5}$$

$$= \frac{25}{20} - \frac{8}{20}$$

$$= \frac{17}{20}$$

If she did the experiment twice she would have $\frac{17}{20}$ left.
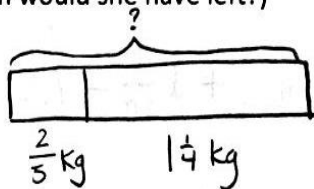
$$\frac{2}{5} + 1\frac{1}{4} = \left(\frac{2}{5} \times \frac{4}{4}\right) + \left(\frac{5}{4} \times \frac{5}{5}\right) \qquad 1\frac{1}{4} = \frac{5}{4}$$

$$= \frac{8}{20} + \frac{25}{20}$$

$$= \frac{33}{20}$$

$$= \frac{20}{20} + \frac{13}{20} \Rightarrow 1\frac{13}{20}$$

She had $1\frac{13}{20}$ kg of radium at first.

Name _Jacqueline_____   Date _____

1) Add.

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

$= 3 + \left(\frac{1}{4} \times \frac{5}{5}\right) + \left(\frac{1}{5} \times \frac{4}{4}\right)$

$= 3\frac{5}{20} + \frac{4}{20}$

$= 3\frac{9}{20}$

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

$= 3 + \left(\frac{3}{4} \times \frac{5}{5}\right) + \left(\frac{2}{5} \times \frac{4}{4}\right)$

$= 3\frac{15}{20} + \frac{8}{20}$

$= 3\frac{23}{20} = 4\frac{3}{20}$

c) $1\frac{1}{5} + 2\frac{1}{3} = 3 + \frac{3}{15} + \frac{5}{15}$

$= 3\frac{8}{15}$

d) $4\frac{2}{3} + 1\frac{2}{5} = 5\frac{10}{15} + \frac{6}{15}$

$= 5\frac{16}{15}$

$= 6\frac{1}{15}$

e) $3\frac{1}{3} + 4\frac{5}{7} = 7 + \frac{1}{3} + \frac{5}{7}$

$= 7\frac{7}{21} + \frac{15}{21}$

$= 7\frac{22}{21}$

$= 8\frac{1}{21}$

f) $2\frac{6}{7} + 5\frac{2}{3} = 7\frac{6}{7} + \frac{2}{3}$

$= 7\frac{18}{21} + \frac{14}{21}$

$= 7\frac{32}{21}$

$= 8\frac{11}{21}$

g) $15\frac{1}{5} + 3\frac{5}{8} = 18\frac{8}{40} + \frac{25}{40}$

$= 18\frac{23}{40}$

h) $15\frac{5}{8} + 5\frac{2}{5} = 20\frac{5}{8} + \frac{2}{5}$

$= 20\frac{25}{40} + \frac{16}{40}$

$= 20\frac{41}{40}$

$= 21\frac{1}{40}$

2) Erin jogged 2 ¼ miles on Monday. Wednesday she jogged 3 1/3 miles, and on Friday she jogged 2 2/3 miles. How far did Erin jog altogether?
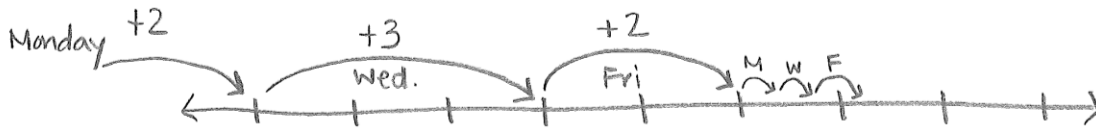
$$7\tfrac{1}{4} + \left(\tfrac{1}{3} + \tfrac{2}{3}\right) = 8\tfrac{1}{4}$$

Erin jogged $8\tfrac{1}{4}$ miles altogether.

3) Darren bought some paint. He used 2 ¼ gallons painting his living room. After that, he had 3 5/6 gallons left. How much paint did he buy?
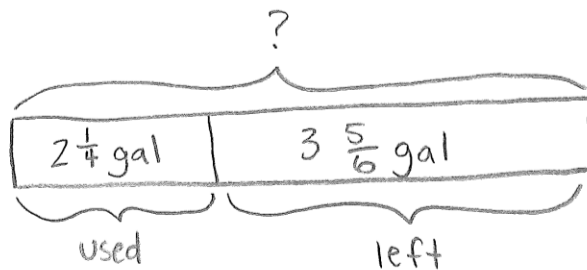
He bought $6\tfrac{2}{24}$ gallons.

$$2\tfrac{1}{4} + 3\tfrac{5}{6}$$
$$= 5\tfrac{1}{4} + \tfrac{5}{6}$$
$$= 5\tfrac{6}{24} + \tfrac{20}{24} \quad = 5\tfrac{26}{24} = 6\tfrac{2}{24}$$

4) Clayton says that $2\tfrac{1}{2} + 3\tfrac{3}{5}$ will be more than 5 but less than 6 since 2 + 3 is 5. Is Clayton's reasoning correct? Prove him right or wrong.

2 + 3 is 5

Is $\tfrac{1}{2} + \tfrac{3}{5}$ more or less than 1?

$\tfrac{1}{2} + \tfrac{3}{5} > 1$ because $\tfrac{1}{2}\left(\tfrac{5}{5}\right) + \tfrac{3}{5}\left(\tfrac{2}{2}\right) = \tfrac{11}{10}$

So Clayton will be wrong because $\tfrac{11}{10} > 1$. The answer will be between 6 and 7.

Name __Jacqueline__   Date __11/15__

1) Generate equivalent fractions to get the same unit, then subtract.

a) $\dfrac{1}{2} - \dfrac{1}{3} = \dfrac{3}{6} - \dfrac{2}{6} = \dfrac{1}{6}$

b) $\dfrac{7}{10} - \dfrac{1}{3} = \dfrac{21}{30} - \dfrac{10}{10} = \dfrac{11}{30}$

c) $\dfrac{7}{8} - \dfrac{3}{4} = \dfrac{7}{8} - \dfrac{6}{8} = \dfrac{1}{8}$

d) $1\dfrac{2}{5} - \dfrac{3}{8} = \dfrac{7}{5} - \dfrac{3}{8} =$

$= \dfrac{56}{40} - \dfrac{15}{40}$

$= \dfrac{31}{40}$

e) $1\dfrac{3}{10} - \dfrac{1}{6} = \dfrac{5}{6} + \dfrac{3}{10}$

$= \dfrac{50}{60} + \dfrac{18}{60}$

$= 1\dfrac{8}{60}$

f) $2\dfrac{1}{3} - 1\dfrac{1}{5} = 1\dfrac{1}{3} - \dfrac{1}{5}$

$1\dfrac{5}{15} - \dfrac{3}{15}$

$= 1\dfrac{2}{15}$

g) $5\dfrac{6}{7} - 2\dfrac{2}{3} = 3\dfrac{6}{7} - \dfrac{2}{3}$

$= 3\dfrac{18}{21} - \dfrac{14}{21}$

$\boxed{= 3\dfrac{4}{21}}$

h) Draw a number line to show your answer to (g) is reasonable.

$5\dfrac{6}{7} - 2$

23
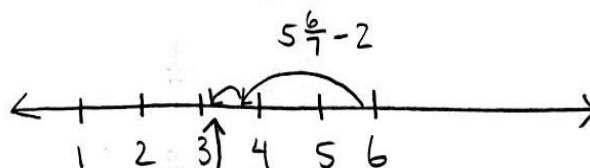
2) George says that to subtract fractions with different denominators, you always have to multiply the denominators to find the common unit, for example:

$$\frac{3}{8} - \frac{1}{6} = \frac{18}{48} - \frac{8}{48}$$

Show George how he could have chosen a denominator smaller than 48, and solve the problem.

8 and 6 are both factors of 24 so

$$\left(\frac{3}{8} \times \frac{3}{3}\right) + \left(\frac{1}{6} \times \frac{4}{4}\right)$$

$$\frac{9}{24} + \frac{4}{24} = \frac{13}{24}$$

3) Meiling has 1 1/4 liter of orange juice. She drinks 1/3 liter. How much orange juice does she have left? (Bonus: If her brother then drinks twice as much as Meiling, how much is left?)

$$1\frac{1}{4} - \frac{1}{3} = \frac{2}{3} + \frac{1}{4} =$$

$$1 \quad \frac{1}{4} = \frac{8}{12} + \frac{3}{12} = \frac{11}{12}$$

She has $\frac{11}{12}$ L left.   Bonus: She has $\frac{1}{4}$ L left.

4) Harlan used 3 1/2 kg of sand to make a large hourglass. To make a small hourglass he only used 1 3/7 kg of sand. How much more sand does it take to make the large hourglass than the small one?

$$3\frac{1}{2} - 1\frac{3}{7}$$

$$= 2\frac{1}{2} - \frac{3}{7}$$ It takes $2\frac{1}{14}$ kg.

$$= 2\frac{7}{14} - \frac{6}{14}$$

$$= 2\frac{1}{14}$$

Name _____Jacqueline_____   Date _____

1) Subtract.

a) $3\frac{1}{5} - 2\frac{1}{4} = \frac{3}{4} + \frac{1}{5}$

$3 \quad \frac{1}{5} \quad = \frac{15}{20} + \frac{4}{20}$

$= \frac{19}{20}$

b) $4\frac{2}{5} - 3\frac{3}{4} = \frac{1}{4} + \frac{2}{5}$

$4 \quad \frac{2}{5} \quad = \frac{5}{20} + \frac{8}{20}$

$= \frac{13}{20}$

c) $7\frac{1}{5} - 4\frac{1}{3} = 3\frac{1}{5} - \frac{1}{3}$

$= 2\frac{6}{5} - \frac{1}{3}$

$= 2\frac{18}{15} - \frac{5}{15}$

$= 2\frac{13}{15}$

d) $7\frac{2}{5} - 5\frac{2}{3} = 2\frac{2}{5} - \frac{2}{3}$

$= 1\frac{7}{5} - \frac{2}{3}$

$= 1\frac{21}{15} - \frac{10}{15}$

$= 1\frac{11}{15}$

e) $4\frac{2}{7} - 3\frac{1}{3} = \frac{2}{3} + \frac{2}{7}$

$4 \quad \frac{2}{7}$

$\frac{14}{21} + \frac{6}{21} =$

$\frac{20}{21}$

f) $9\frac{2}{3} - 2\frac{6}{7} = 7\frac{2}{3} - \frac{6}{7}$

$6\frac{5}{3} - \frac{6}{7}$

$6\frac{35}{21}$
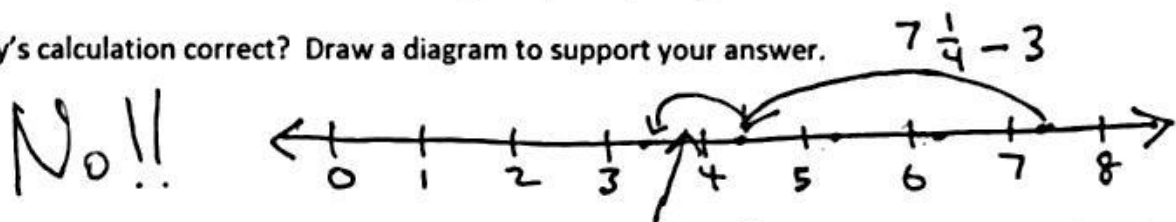
g) $17\frac{2}{3} - 5\frac{5}{6} = 12\frac{2}{3} - 5\frac{5}{6}$

$= 7\frac{2}{3} - \frac{5}{6}$

$= 7\frac{4}{6} - \frac{5}{6}$

$= 6\frac{10}{6} - \frac{5}{6}$

$= 6\frac{5}{6}$

h) $18\frac{1}{3} - 3\frac{3}{8} = 15\frac{1}{3} - \frac{3}{8}$

$= 15\frac{8}{24} - \frac{9}{24}$

$= 14\frac{23}{24}$

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2) Toby wrote the following:

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

Is Toby's calculation correct? Draw a diagram to support your answer.

No!!

$7\frac{1}{4} - 3$

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

You have to be careful to go down.

3) Mr. Neville Iceguy mixed up 12 3/5 gallons of chili for a party. If 7 ¾ gallons of chili was mild, and the rest was extra spicy, how much extra spicy chili did Mr. N. Iceguy make?

12 $\frac{3}{5}$ gallons

7 $\frac{3}{4}$ gal   ?

mild   extra spicy
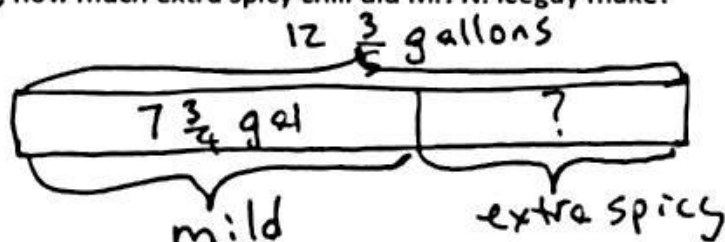
$12\frac{3}{5} - 7\frac{3}{4} =$

$5\frac{3}{5} - \frac{3}{4} = 4\frac{8}{5} - \frac{3}{4} = 4\frac{32}{20} - \frac{15}{20} = 4\frac{17}{20}$

Mr. N. Iceguy made $4\frac{17}{20}$ gallons.

4) Jazmyne determined to spent 6 ½ hours studying over the weekend. She spent 1 ¼ hours studying on Friday evening, and 2 2/3 hours on Saturday. How much longer does she need to spend studying on Sunday in order to reach her goal?

6 $\frac{1}{2}$ hours

F   S   Sunday
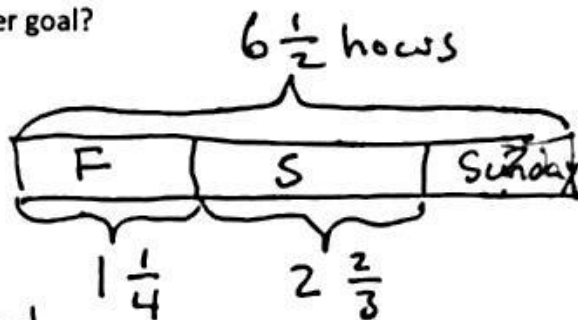
1 $\frac{1}{4}$ 2 $\frac{2}{3}$

Jazmyne needs

$1\frac{7}{12}$ hr more of study.

$6\frac{1}{2} - 1\frac{1}{4} =$

$6\frac{2}{4} - 1\frac{1}{4} =$

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

$3\frac{3}{12} - \frac{8}{12}$

$= 2\frac{15}{12} - \frac{8}{12}$

$= 1\frac{7}{12}$

Name _Jacqueline_____   Date _____

1) Are the following greater than or less than 1? Circle greater or less.

   a) $\frac{1}{2} + \frac{2}{7}$ greater than 1   (less than 1)

   b) $\frac{5}{8} + \frac{3}{5}$ (greater than 1)   less than 1

   c) $1\frac{1}{4} - \frac{1}{3}$ greater than 1   (less than 1)

   d) $3\frac{5}{8} - 2\frac{5}{9}$ (greater than 1)   less than 1

2) Are the following greater than or less than ½? Circle greater or less.

   a) $\frac{1}{4} + \frac{2}{3}$ (greater than $\frac{1}{2}$)   less than $\frac{1}{2}$

   b) $\frac{3}{7} - \frac{1}{8}$ greater than $\frac{1}{2}$ (less than $\frac{1}{2}$)

   c) $1\frac{1}{7} - \frac{7}{8}$ greater than $\frac{1}{2}$ (less than $\frac{1}{2}$)

   d) $\frac{3}{7} + \frac{2}{6}$ (greater than $\frac{1}{2}$)   less than $\frac{1}{2}$

3) Use >,<, or = to make the following statements true?

   a) $5\frac{2}{3} + 3\frac{3}{4}$ __>__ $8\frac{2}{3}$

   b) $4\frac{5}{8} - 3\frac{2}{5}$ __<__ $1\frac{5}{8} + \frac{2}{5}$

   c) $5\frac{1}{2} + 1\frac{3}{7}$ __=__ $6 + \frac{13}{14}$

   d) $15\frac{4}{7} - 11\frac{2}{5}$ __<__ $4\frac{4}{7} + \frac{2}{5}$

4) Is it true that $4\frac{3}{5} - 3\frac{2}{3} = 1 + \frac{3}{5} + \frac{2}{3}$? Prove your answer.

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

$$= 1 + \frac{3}{5} - \frac{2}{3}$$

No! Its not true! Its $\frac{2}{3}$ less not more.

5) Jackson needs to be $1\frac{3}{4}$ inches taller in order to ride the roller coaster. Since he can't wait, he puts on a pair of boots that add $1\frac{1}{6}$ inches to his height, and slips an insole inside to add another $\frac{1}{8}$ inches to his height. Will this make Jackson appear tall enough to ride the roller coaster?

$$1\frac{1}{6} + \frac{1}{8} > 1\frac{3}{4}?$$

$$\text{Oops No} \quad \frac{1}{6} + \frac{1}{8} < \frac{1}{2}$$

6) A baker needs 5 lbs of butter for a recipe. She found 2 portions that each weigh 1 1/6 lb, and a portion that weighs 2 2/7 lb. Does she have enough butter for her recipe?

$$1\frac{1}{6} + 1\frac{1}{6} + 2\frac{2}{7} > 5.\text{lbs}$$

$$1 + 1 + 2 + \frac{1}{3} + \frac{2}{7}$$

$$4 + \left(\frac{1}{8} + \frac{2}{7}\right) < 5\,\text{lbs}$$

No the baker does not have enough butter.   less than 1!

Name __Jacqueline__   Date __11/18__

1) Rearrange the terms so that you can add or subtract mentally, then solve.

a) $\frac{1}{4} + 2\frac{2}{3} + \frac{7}{4} + \frac{1}{3}$

$\left(\frac{1}{4} + \frac{7}{4}\right) + \left(2\frac{2}{3} + \frac{1}{3}\right) =$

$2 + 3 = 5$

b) $2\frac{3}{5} - \frac{3}{4} + \frac{2}{5}$

$\left(2\frac{3}{5} + \frac{2}{5}\right) - \frac{3}{4} =$

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

c) $4\frac{3}{7} - \frac{3}{4} - 2\frac{1}{4} - \frac{3}{7}$

$\left(4\frac{3}{7} - \frac{3}{7}\right) - \left(\frac{3}{4} + 2\frac{1}{4}\right)$

$4 - 3 = 1$

d) $\frac{5}{6} + \frac{1}{3} - \frac{4}{3} + \frac{1}{6}$

$\left(\frac{5}{6} + \frac{1}{6}\right) - \frac{3}{3}$

$= 0$

2) Fill in the blank to make the statement true.

a) $11\frac{2}{5} - 3\frac{2}{3} - \frac{11}{3} = \underline{4\frac{1}{15}}$

$11\frac{2}{5} - 6 - \frac{4}{3}$

$= 5\frac{2}{5} - 1\frac{1}{3}$

$= 4\frac{2}{5} - \frac{1}{3} = 4\frac{6}{15} - \frac{5}{15} = \boxed{4\frac{1}{15}}$

b) $11\frac{7}{8} + 3\frac{1}{5} - \underline{\frac{3}{40}} = 15$

$14\frac{7}{8} + \frac{1}{5}$

$14\frac{35}{40} + \frac{8}{40} =$

$14\frac{43}{40} = 15\frac{3}{40} - \boxed{\frac{3}{40}} = 15$

c) $\frac{5}{12} - \underline{\hspace{1cm}} + \frac{5}{4} = \frac{2}{3}$

$\frac{5}{12} - \underline{\hspace{1cm}} + \frac{15}{12} = \frac{8}{12}$

$\frac{20}{12} - \underline{\hspace{0.5cm}} = \frac{8}{12}$

$1\frac{8}{12} - \boxed{1} = \frac{8}{12}$

d) $\underline{58\frac{11}{12}} - 30 - 7\frac{1}{4} = 21\frac{2}{3}$

$30 + 7\frac{1}{4} + 21\frac{2}{3} =$

$58\frac{1}{4} + \frac{2}{3} = \boxed{58\frac{11}{12}}$

e) $\frac{24}{5} + \underline{\hspace{1cm}} + \frac{8}{7} = 9$

f) $11.1 + 3\frac{1}{10} - \underline{\hspace{1cm}} = \frac{99}{10}$

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e) $\frac{24}{5} + \underline{\hspace{1cm}} + \frac{8}{7} = 9$

$$\frac{24}{5} + \frac{8}{7} =$$

$$4\frac{4}{5} + 1\frac{1}{2} = 5\frac{28}{35} + \frac{5}{35}$$

$$9 - 5 = 4 \qquad 4 - \frac{33}{35} - 3\frac{2}{35}$$

f) $11.1 + 3\frac{1}{10} - \underline{\hspace{1cm}} = \frac{99}{10}$

$$11.1 + 3.1 - \underline{\hspace{0.5cm}} = 9.9$$

$$14.2 - \underline{\hspace{0.5cm}} = 9.9$$

$$\begin{array}{r} \overset{13}{\cancel{1}}.12 \\ - 9.9 \\ \hline 4.3 \end{array} = 4.3$$

3) DeAngelo needs 100 lbs of garden soil to landscape a building. In the company's storage area, he finds 2 cases holding 24 3/4 lbs of garden soil each, and a third case holding 19 3/8 lbs. How much gardening soil does DeAngelo still need in order to do the job?

$$24\frac{3}{4} + 24\frac{3}{4} + 19\frac{3}{8} + \underline{\hspace{1cm}} = 100$$

$$67\frac{6}{4} + \frac{3}{8} =$$

$$68\frac{4}{8} + \frac{3}{8} = 68\frac{7}{8}$$

$$100 - 68\frac{7}{8} = 31\frac{1}{8} \text{ lbs of garden soil.}$$

69   31

DeAngelo needs $31\frac{1}{8}$ lbs of garden soil.

4) Volunteers helped clean up 8.2 kg of trash in one neighborhood and 11 ½ kg in another. They sent 1 ¼ kg to be recycled, and threw the rest away. How many kilograms of trash did they throw away?

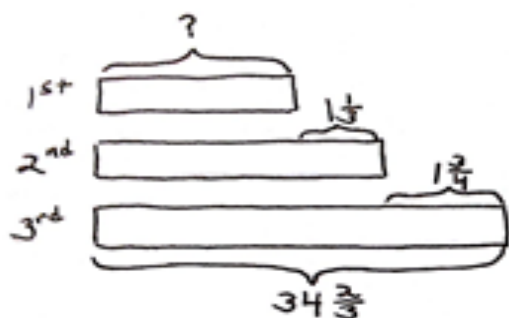$$8.2 \text{ kg} + 11\frac{1}{2} \text{ kg} - 1\frac{1}{4} = \underline{\hspace{1cm}}$$

$$8.2 + 11.5 - 1.25 =$$

$$19.7 - 1.25 = 18.25$$

They threw away $18\frac{1}{4}$ kg of trash!

Problem 1

In a race, the second place finisher crossed the finish line 1 1/3 minutes after the winner. The third place finisher was 1 3/4 minutes behind the second place finisher. The third place finisher took 34 2/3 minutes. How long did the winner take?
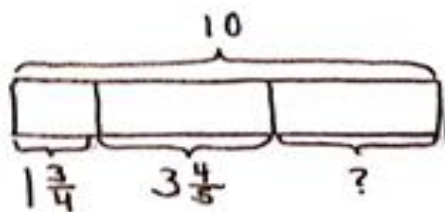

$$34\tfrac{2}{3} - 1\tfrac{3}{4} = 33\tfrac{2}{3} - \tfrac{3}{4}$$
$$= 33\tfrac{8}{12} - \tfrac{9}{12}$$
$$= 32\tfrac{20}{12} - \tfrac{9}{12}$$
$$= 32\tfrac{11}{12}$$

$$32\tfrac{11}{12} - 1\tfrac{1}{3} = 31\tfrac{11}{12} - \tfrac{1}{3}$$
$$= 31\tfrac{11}{12} - \tfrac{4}{12}$$
$$= 31\tfrac{7}{12}$$

The 1st place time was 31 min 35 s.

$$31\tfrac{7}{12} \text{ min} = 31\tfrac{35}{60} \text{ min} = 31\text{min } 35s$$

Problem 2

John used 1 3/4 kg of salt to melt the ice on his sidewalk. He then used another 3 4/5 kg on the driveway. If he originally bought 10 kg of salt, how much does he have left?

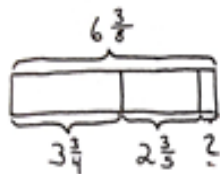He had $4\tfrac{9}{20}$ kg of salt left.

$$1\tfrac{3}{4} + 3\tfrac{4}{5} = 4\tfrac{3}{4} + \tfrac{4}{5}$$
$$= 4\tfrac{15}{20} + \tfrac{16}{20}$$
$$= 4\tfrac{31}{20}$$
$$= 5\tfrac{11}{20}$$

$$10 - 5\tfrac{11}{20} = 5 - \tfrac{11}{20}$$
$$= 4\tfrac{9}{20}$$

Problem 3

Sinister Stan stole 3 3/4 oz of slime from Messy Molly, but his evil plans required 6 3/8 oz of slime. He stole another 2 3/5 oz from Rude Ralph. How much more slime does Sinister Stan need for his evil plan?
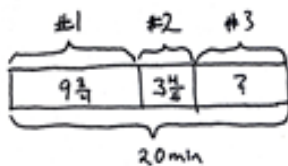

$$3\frac{3}{4} + 2\frac{3}{5} = 5\frac{3}{4} + \frac{3}{5}$$
$$= 5\frac{15}{20} + \frac{12}{20}$$
$$= 5\frac{27}{20}$$
$$= 6\frac{7}{20}$$

Sinister Stan needs $\frac{1}{40}$ ounce of slime.

$$6\frac{3}{8} - 6\frac{7}{20} = \frac{3}{8} - \frac{7}{20}$$
$$= \frac{15}{40} - \frac{14}{40}$$
$$= \frac{1}{40}$$

Problem 4

Gavin had 20 minutes to do a three-problem quiz. He spent 9 3/4 minutes on question 1 and 3 4/5 minutes on question 2. How much time did he have left for question 3? Write the answer in minutes and seconds.

$$20 - 9\frac{3}{4} - 3\frac{4}{5}$$
$$= 19\frac{20}{20} - 9\frac{15}{20} - 3\frac{16}{20}$$
$$= 10\frac{5}{20} - 3\frac{16}{20}$$
$$= 9\frac{25}{20} - 3\frac{16}{20}$$
$$= 6\frac{9}{20}$$

$$6\frac{1}{20} = 6\frac{27}{60}$$
$$= 6\text{min } 27\text{seconds}$$

He had 6 minutes 27 seconds for question 3.

COMMON CORE | Lesson 15: | Solve multi-step word problems; assess reasonableness of solutions using benchmark numbers.

Date: 11/12/13

engage^ny   3.D.34

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Problem 5

Matt wants to save 2 1/2 minutes on his 5K race time. After a month of hard training, he managed to lower his overall time from 21 1/5 minutes to 19 1/4 minutes. By how many more minutes does Matt need to lower his race time?
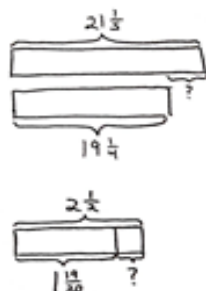
$$21\tfrac{1}{5} - 19\tfrac{1}{4} = 2\tfrac{1}{5} - \tfrac{1}{4}$$
$$= 2\tfrac{4}{20} - \tfrac{5}{20}$$
$$= 1\tfrac{24}{20} - \tfrac{5}{20}$$
$$= 1\tfrac{19}{20}$$

$$2\tfrac{1}{2} - 1\tfrac{19}{20} = 1\tfrac{1}{2} - \tfrac{19}{20}$$
$$= 1\tfrac{10}{20} - \tfrac{19}{20}$$
$$= \tfrac{30}{20} - \tfrac{19}{20}$$
$$= \tfrac{11}{20}$$

Matt needs to save $\tfrac{11}{20}$ min off his race time.

COMMON CORE | Lesson 15: Solve multi-step word problems; assess reasonableness of solutions using benchmark numbers.
Date: 11/12/13

engage^ny

3.D.35

Names ___John___ and ___Erica___   Date _____

Unknowns.

1. Draw the following ribbons. When finished, compare your work to your partner's.

   a) 1 ribbon. The piece shown below is only 1/3 of it. Complete the drawing to show the whole piece of ribbon.

   b) 1 ribbon. The piece shown below is 4/5 of it. Complete the drawing to show the whole piece of ribbon.
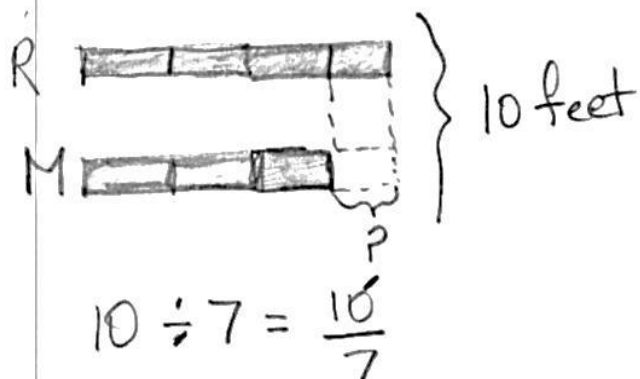

   c) 2 ribbons A and B. One third of A is equal to all of B. Draw a picture of the ribbons.

   d) 3 ribbons C, D, and E. C is half the length of D. E is twice as long as D. Draw a picture of the ribbons.
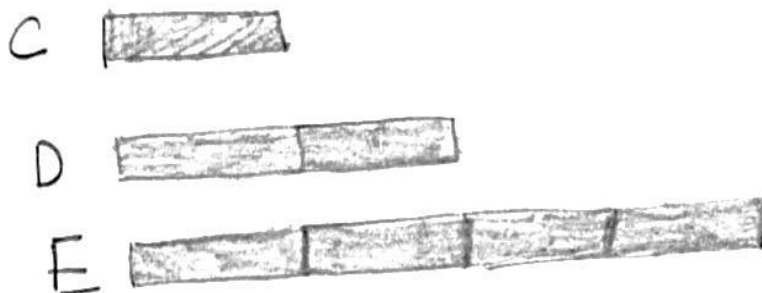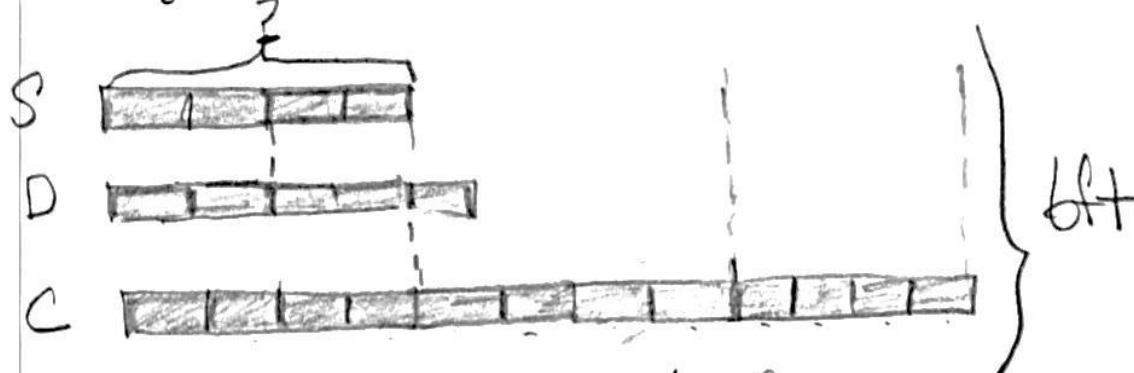
2. Half Robert's piece of wire is equal to 2 thirds of Maria's wire. The total length of their wires is 10 feet. How much longer is Robert's wire than Maria's?

$$10 \div 7 = \frac{10}{7}$$

Roberts' wire is $\frac{10}{7}$ ft longer than Maria's.

3. Half Sarah's wire is equal to 2/5 of Daniel's. Chris has 3 times as much as Sarah. In all their wire measures 6 ft. How long is Sarah's wire in feet?

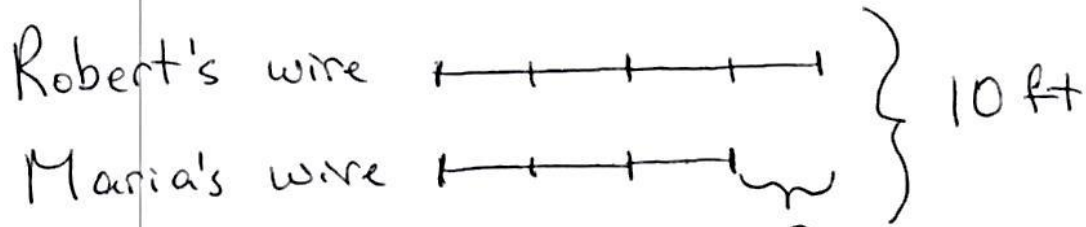$$6 ft \div 21 = \frac{6}{21} ft$$

$$\frac{6}{21} + \frac{6}{21} + \frac{6}{21} + \frac{6}{21} = \frac{24}{21} = \frac{8}{7}$$

Sarahs wire is $\frac{8}{7}$ ft long.

2. Half Robert's piece of wire is equal to 2 thirds of Maria's wire. The total length of their wires is 10 feet. How much longer is Robert's wire than Maria's?
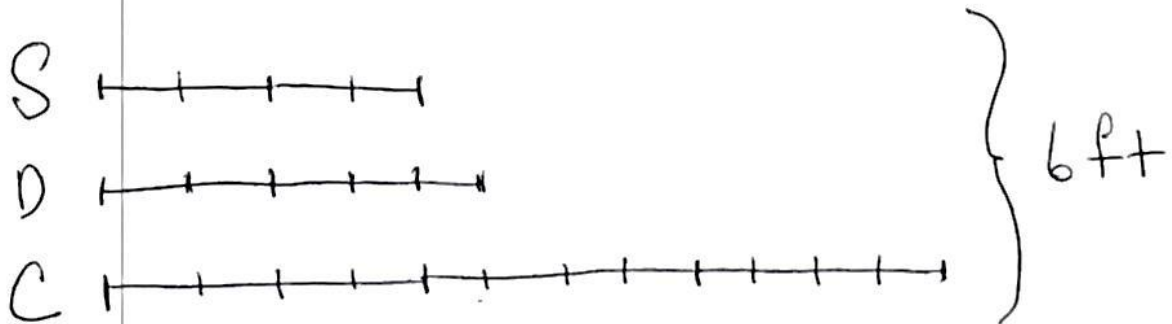
Robert's wire ├──┼──┼──┤ ⎫
Maria's wire ├──┼──┼──↝ ⎬ 10 ft
⎭

7 units = 10 ft   ?

1 unit = $\frac{10}{7}$

Robert's wire is $\frac{10}{7}$ foot longer than Maria's.

3. Half Sarah's wire is equal to 2/5 of Daniel's. Chris has 3 times as much as Sarah. In all their wire measures 6 ft. How long is Sarah's wire in feet?

S ├──┼──┼──┼──┤
D ├──┼──┼──┼──┤ ⎫
C ├──┼──┼──┼──┼──┼──┼──┼──┼──┼──┤ ⎬ 6 ft
⎭

21 units = 6 ft

1 unit = $\frac{6 \, ft}{21 \, ft}$

= $\frac{2}{7}$ ft

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

Sarah's wire is $1\frac{1}{7}$ ft long.

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