

Get out your homework from yesterday and have it ready to check.
Warm Up on the problems below. We will have a target check
tomorrow and a quiz on ~~Monday~~ **Tuesday**

Classwork - Adding and Subtracting Mixed Numbers

Warm Up: Solve the Addition or Subtraction problems

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

$$\frac{6}{8} - \frac{1}{8} = \frac{5}{8}$$

$$\frac{5}{6} + \frac{2}{3}$$

$$\frac{5}{6} + \frac{4}{6} = \frac{9}{6} = \frac{3}{2} = 1\frac{1}{2}$$

U1 L11 Adding and Subtracting Like/Unlike Fractions

Date: _____ Class: _____

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

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

$$\frac{8}{9} - \frac{2}{6} =$$

$$\frac{16}{18} - \frac{6}{18} = \frac{10}{18} = \frac{5}{9}$$

$$\frac{5}{12} - \frac{1}{3} =$$

$$\frac{5}{12} - \frac{4}{12} = \frac{1}{12}$$

$$\frac{5}{8} + \frac{1}{8} = \frac{6}{8} = \frac{3}{4}$$

$$\frac{1}{3} - \frac{3}{12} =$$

$$\frac{4}{12} - \frac{3}{12} = \frac{1}{12}$$

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

$$\frac{3}{4} + \frac{2}{4} = \frac{5}{4} = \frac{11}{4}$$

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

$$\frac{6}{12} + \frac{2}{12} = \frac{8}{12} = \frac{2}{3}$$

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

$$\frac{8}{12} - \frac{6}{12} = \frac{2}{12} = \frac{1}{6}$$

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

$$\frac{5}{10} + \frac{4}{10} = \frac{9}{10}$$

$$\frac{5}{6} - \frac{7}{12} =$$
$$\frac{10}{12} - \frac{7}{12} = \frac{3}{12} = \frac{1}{4}$$

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

$$\frac{8}{9} - \frac{4}{6} =$$
$$\frac{16}{18} - \frac{12}{18} = \frac{4}{18} = \frac{2}{9}$$

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

$$\frac{5}{7} - \frac{1}{7} = \frac{4}{7}$$

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

$$\frac{2}{3} - \frac{7}{8} =$$
$$\frac{16}{24} - \frac{21}{24} = \frac{-5}{24}$$

$$\frac{-4}{5} + \frac{3}{10} =$$
$$\frac{-8}{10} + \frac{3}{10} = \frac{-5}{10} = \frac{-1}{2}$$

$$\frac{-3}{4} + \left(-\frac{5}{6}\right) =$$
$$\frac{-9}{12} + \left(-\frac{10}{12}\right) = \frac{-19}{12} = \frac{-19}{12}$$

$$\frac{-5}{10} = \frac{-1}{2}$$

21. **STATES** Most of the state names in the United States end in a vowel. Of the 50 states, 25 of the state names end in either an a or an e and 6 end in either an i or an o. If none of the state names end in a u, what is the fraction of state names that end in a vowel?

$$\frac{25}{50} + \frac{6}{50} = \frac{31}{50}$$

22. **JIGSAW PUZZLES** Over the weekend, Halverson had put together $\frac{3}{16}$ of a jigsaw puzzle, while Jaime put together $\frac{10}{16}$ of the puzzle. Who had completed a greater fraction of the jigsaw puzzle, and by how much?

$$\frac{10}{16} - \frac{3}{16} = \frac{7}{16}$$
 Jaime completed $\frac{7}{16}$ more



23. **TULIPS** Solan and Julie each planted tulips. Of Solan's 20 tulips, 15 were red, while 10 of Julie's 20 tulips were red. How much greater was Solan's fraction of red tulips than Julie's?

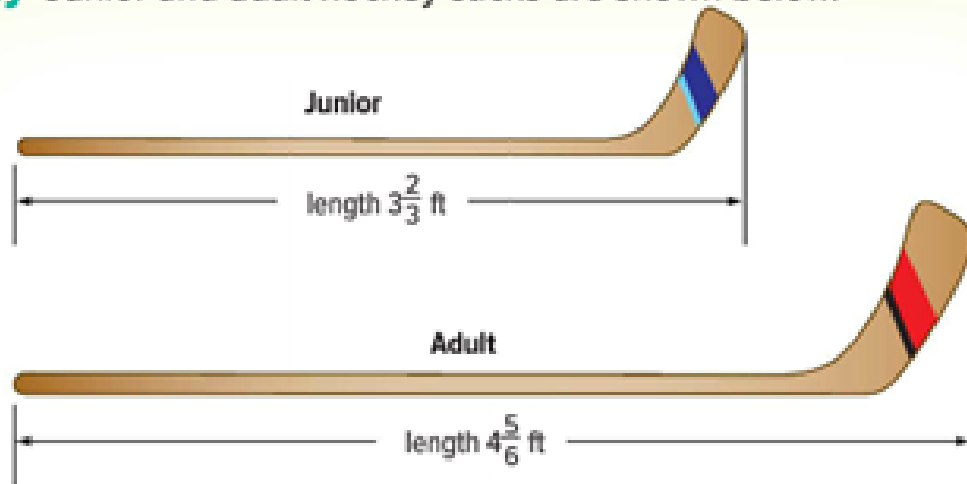
$$\frac{15}{20} - \frac{10}{20} = \frac{5}{20} \div 5 = \frac{1}{4}$$
 Solan's was $\frac{1}{4}$ greater.





Real-World Link

Hockey Junior and adult hockey sticks are shown below.



$$3\frac{2}{3} = 3\frac{2 \cdot 2}{3 \cdot 2} = 3\frac{4}{6}$$

- Use the expression $4\frac{5}{6} - 3\frac{2}{3}$ to find how much longer the adult hockey stick is than the junior hockey stick.

Rename the fractions
using the LCD, 6.

Subtract the fractions.
Then subtract the
whole numbers.

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

- Explain how to find $3\frac{7}{10} - 2\frac{2}{5}$. Then use your conjecture to find the difference.

Add and Subtract Mixed Numbers

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To add or subtract mixed numbers, first add or subtract the fractions. If necessary, rename them using the LCD. Then add or subtract the whole numbers and simplify if necessary.

Sometimes when you subtract mixed numbers, the fraction in the first mixed number is less than the fraction in the second mixed number. In this case, rename one or both fractions in order to subtract.

Examples



1. Find $7\frac{4}{9} + 10\frac{2}{9}$. Write in simplest form.

Estimate $7 + 10 = 17$

$$\begin{array}{r} 7\frac{4}{9} \\ + 10\frac{2}{9} \\ \hline \end{array}$$

Add the whole numbers and fractions separately.

$$17\frac{6}{9} \text{ or } 17\frac{2}{3}$$

Simplify.

Check for Reasonableness $17\frac{2}{3} \approx 17$ ✓

2. Find $8\frac{5}{6} - 2\frac{1}{3}$. Write in simplest form.

Estimate $9 - 2 = 7$

$$\begin{array}{r} 8\frac{5}{6} \\ - 2\frac{1}{3} \\ \hline \end{array}$$

→

$$8\frac{5}{6}$$

→

$$- 2\frac{2}{6}$$

Rename the fraction using the LCD. Then subtract.

$$6\frac{3}{6} \text{ or } 6\frac{1}{2}$$

Simplify.

Check for Reasonableness $6\frac{1}{2} \approx 7$ ✓

$$\frac{2^4}{4} + 3 \frac{3^3}{4 \cdot 3}$$

$$\frac{2^8}{2} + 3 \frac{9}{12} = \frac{4}{12} \frac{17}{7} = \frac{55}{12}$$

$$\frac{17}{12} \frac{11}{5} + \frac{4}{4} = \frac{57}{12} \frac{11}{5}$$

Got it? Do these problems to find out.

Add or subtract. Write in simplest form.

a. $6\frac{1}{8} + 2\frac{5}{8}$
 $= 8\frac{6}{8} \div 2 = 8\frac{3}{4}$

b. $5\frac{1}{5} + 2\frac{3}{10}$
 $5\frac{2}{10} + 2\frac{3}{10}$
 $7\frac{5}{10} \div 5 = 7\frac{1}{2}$

c. $1\frac{5}{9} + 4\frac{1}{6}$
 $1\frac{10}{18} + 4\frac{3}{18} = 5\frac{13}{18}$

d. $5\frac{4}{5} - 1\frac{3}{10}$
 $5\frac{8}{10} - 1\frac{3}{10}$
 $= 4\frac{5}{10} = 4\frac{1}{2}$

e. $13\frac{7}{8} - 9\frac{3}{4}$
 $13\frac{7}{8} - 9\frac{6}{8}$
 $4\frac{1}{8}$

f. $8\frac{2}{3} - 2\frac{1}{2}$
 $8\frac{4}{6} - 2\frac{3}{6} = 6\frac{1}{6}$

Example

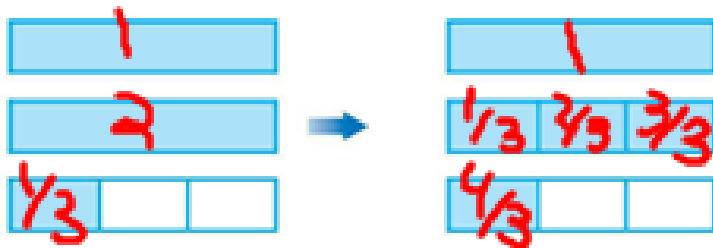
3. Find $2\frac{1}{3} - 1\frac{2}{3}$.

Tutor

Method 1 Rename Mixed Numbers

Estimate $2 - 1\frac{1}{2} = \frac{1}{2}$

Since $\frac{1}{3}$ is less than $\frac{2}{3}$, rename $2\frac{1}{3}$ before subtracting.



$$2\frac{1}{3} = 1\frac{3}{3} + \frac{1}{3} \text{ or } 1\frac{4}{3}$$

$$\begin{array}{r} 2\frac{1}{3} \rightarrow 1\frac{4}{3} \\ -1\frac{2}{3} \rightarrow -1\frac{2}{3} \\ \hline \frac{2}{3} \end{array}$$

Rename $2\frac{1}{3}$ as $1\frac{4}{3}$.
Subtract the whole numbers and then the fractions.

Check for Reasonableness $\frac{2}{3} \approx \frac{1}{2}$ ✓

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

$$1\frac{4}{3} - 1\frac{2}{3} = \cancel{0}^2\frac{2}{3} = \frac{2}{3}$$

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

Method 2 Write as Improper Fractions

$$\begin{array}{r} 2\frac{1}{3} \rightarrow \frac{7}{3} \\ -1\frac{2}{3} \rightarrow -\frac{5}{3} \\ \hline \frac{2}{3} \end{array}$$

Write $2\frac{1}{3}$ as $\frac{7}{3}$.
Write $1\frac{2}{3}$ as $\frac{5}{3}$.
Simplify.

$$\text{So, } 2\frac{1}{3} - 1\frac{2}{3} = \frac{2}{3}.$$

Using either method, the answer is $\frac{2}{3}$.

Got it? Do these problems to find out.

Subtract. Write in simplest form.

g. $7 - 1\frac{1}{2}$

$7 = 6\frac{2}{2}$
 $6\frac{2}{2} - 1\frac{1}{2} = 5\frac{1}{2}$

h. $5\frac{3}{8} - 4\frac{11}{12}$

$5\frac{9}{24} - 4\frac{22}{24}$

$4\frac{33}{24} - 4\frac{22}{24} = 1\frac{11}{24}$

i. $11\frac{2}{5} - 2\frac{3}{5}$

j. $8 - 3\frac{3}{4}$

k. $3\frac{1}{4} - 1\frac{3}{4}$

l. $16 - 5\frac{5}{6}$