Memphis Math: Treasure of the Tomb
Equation Help Contents

Math Problems & Objectives

Fractions: Equivalents

FEQ01

Multiply to make an equivalent fraction.

Sample Problem:

$$\frac{1}{2} \cdot \frac{3}{3} = \frac{[\,]}{[\,]}$$

Hint:
Multiply the numerator and denominator by the same number.

$1 \cdot 3 = 3$

$2 \cdot 3 = 6$

Solution:

$$\frac{1}{2} \cdot \frac{3}{3} = \frac{|3|}{|6|}$$

FEQ02

Find the number that makes this equivalent fraction.

Sample Problem:

$$\frac{1}{2} \cdot \frac{[]}{[]} = \frac{3}{6}$$

Hint:
Multiply the numerator and denominator by the same number.

$1 \cdot 3 = 3$
$2 \cdot 3 = 6$

Solution:

$$\frac{1}{2} \cdot \frac{|3|}{|3|} = \frac{3}{6}$$

FEQ03

Divide to make an equivalent fraction.

Sample Problem:

$$\frac{3}{6} \div \frac{3}{3} = \frac{[]}{[]}$$

Hint:
Divide the numerator and denominator by the same number.

$$3 \div 3 = 1$$
$$6 \div 3 = 2$$

Solution:

$$\frac{3}{6} \div \frac{3}{3} = \frac{[1]}{[2]}$$

FEQ04

Find the number that makes this equivalent fraction.

Sample Problem:

$$\frac{3}{6} \cdot \frac{[\,]}{[\,]} = \frac{1}{2}$$

Hint:
Divide the numerator and denominator by the same number.

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

Solution:

$$\frac{3}{6} \cdot \frac{[3]}{[3]} = \frac{1}{2}$$

FEQ05

Change the whole number to an improper fraction or change the fraction to a whole number.

Sample Problem:

$$5 = \frac{[\,]}{1} \text{ or } 5 = \frac{5}{[\,]}$$

Hint:
A whole number always equals the numerator of a fraction with 1 as the denominator.

5 = numerator

1 = denominator

Solution:

$$5 = \frac{[5]}{1} \text{ or } 5 = \frac{5}{[1]}$$

FEQ06

Change this improper fraction to a whole number.

Sample Problem:

$$\frac{8}{4} \rightarrow []$$

Hint:
A fraction can be read as a division problem.   Divide the numerator by the denominator.

$8 \div 4 = 2$

Solution:

$$\frac{8}{4} \rightarrow |2|$$

FEQ07

Change the whole number to an equivalent mixed number or change the mixed number to a whole number.

Sample Problem:

$$6 = 5\frac{[\,]}{4} \quad \text{or} \quad [\,] = 5\frac{4}{4}$$

Hint:
A fraction equals 1 when the numerator and denominator are the same.

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

Rename the whole number as 1 less, plus a fraction equal to 1.

$$6 = 5 + 1$$

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

Solution:

$$6 = 5\frac{|4|}{4} \quad \text{or} \quad |6| = 5\frac{4}{4}$$

Fractions: Lowest Terms

FLT01 **Simplify a fraction <1.**
FLT02 **Simplify a fraction <1.**
FLT03 **Simplify a fraction <1.**
FLT04 **Simplify a fraction <1.**
FLT05 **Tell whether a fraction <1 is in lowest terms.**
FLT06 **Name a common denominator of two lowest term fractions <1.**
FLT07 **Name a common denominator of two lowest term fractions <1.**
FLT08 **Name a common denominator of two lowest term fractions <1.**

FLT01

Reduce this fraction to lowest terms.

Sample Problem:

$$\frac{3}{6} = \frac{[\ ]}{[\ ]}$$

Hint:
Divide the numerator and denominator by the numerator.

$3 , 3 = 1$
$6 , 3 = 2$

Solution:

$$\frac{3}{6} = \frac{[1]}{[2]}$$

FLT02

Reduce this fraction to lowest terms.

Sample Problem:

$$\frac{6}{54} = \frac{[]}{[]}$$

Hint:
Divide the numerator and denominator by the numerator.

$$\frac{6 \div 6 = 1}{54 \div 6 = 9}$$

Solution:

$$\frac{6}{54} = \frac{[1]}{[9]}$$

FLT03

Reduce this fraction to lowest terms.

Sample Problem:

$$\frac{10}{16} \quad \frac{[]}{[]}$$

Hint:
Divide the numerator and denominator by the same number.   Use the largest number you can.

$$10 \, , \, 2 = 5$$
$$16 \, , \, 2 = 8$$

Solution:

$$\frac{10}{16} \quad \frac{[5]}{[8]}$$

FLT04

Reduce this fraction to lowest terms.

Sample Problem:

$$\frac{81}{90} = \frac{[\,]}{[\,]}$$

Hint:

Divide the numerator and denominator by the same number.   Use the largest number you can.

$$81 , 9 = 9$$
$$90 , 9 = 10$$

Solution:

$$\frac{81}{90} = \frac{[9]}{[10]}$$

FLT05

Is this fraction in lowest terms?

Sample Problem:

$$\frac{10}{16} \div [\ ]$$

Hint:
If you can divide the numerator and denominator by the same number it is not in lowest terms.   Try dividing by small numbers like 2,3 and 5.

$10 \div 2 = 5$
$16 \div 2 = 8$

Solution:

$$\frac{10}{16} \div |no\,|$$

FLT06

Find the least common denominator.

Sample Problem:

$\frac{1}{2}$ and $\frac{3}{5}$ [ ]

Hint:
When the denominators have no common factors, multiply the denominators to get the least common denominator.

$\frac{1}{2} \cdot \frac{3}{5}$ $2 \cdot 5 = 10$

Solution:

$\frac{1}{2}$ and $\frac{3}{5}$ |10|

FLT07

Find the least common denominator.

Sample Problem:

$\frac{1}{2}$ and $\frac{3}{8}$ [ ]

Hint:
If one denominator is a factor of the other, the larger denominator equals the least common denominator.

2 is a factor of   8

8 = least common denominator

Solution:

$\frac{1}{2}$ and $\frac{3}{8}$ |8|

FLT08

Find the least common denominator.

Sample Problem:

$\dfrac{1}{6}$ and $\dfrac{2}{15}$ [ ]

Hint:
List multiples of both denominators until you find the smallest number that is a multiple of both.

6, 12, 18, 24, **30**, 36, ...

15, **30**, 45, 60, ...

30 = least common denominator

Solution:

$\dfrac{1}{6}$ and $\dfrac{2}{15}$ |30 |

Fractions: Comparing

FCM01   Compare two fractions <1 with a common denominator.
FCM02   Compare two fractions <1 with different denominators.
FCM03   Compare two proper mixed numbers with a common denominator.
FCM04   Compare two proper mixed numbers with the same whole number.
FCM05   Compare two fractions <1.
FCM06   Compare two fractions <1.
FCM07   Compare two proper mixed numbers with different denominators.

FCM01

Use <,>, or = to compare these fractions.

Sample Problem:

$$\frac{15}{18} \quad [\quad] \quad \frac{7}{18}$$

Hint:
When the denominators are equal, compare the numerators.

15 > 7
18 = 18

Solution:

$$\frac{15}{18} \quad [>] \quad \frac{7}{18}$$

FCM02

Use <,>, or = to compare these fractions.

Sample Problem:

$$\frac{1}{3} [\ ] \frac{1}{5}$$

Hint:
When the numerators both equal 1, compare the denominators.   The largest fraction has the smallest denominator.

```
   1   =   1
Thirds  >  Fifths
[ ][ ][ ]   [][][][][]
```

Solution:

$$\frac{1}{3} |>| \frac{1}{5}$$

FCM03

Use <,>, or = to compare these mixed numbers.

Sample Problem:

$6\frac{1}{3}$ [ ] $5\frac{2}{3}$

Hint:
Look at the whole numbers.   The mixed number with the largest whole number is greater.

6 > 5

Solution:

$6\frac{1}{3}$ |>| $5\frac{2}{3}$

FCM04

Use <,>, or = to compare these mixed numbers.

Sample Problem:

$6\frac{1}{3}$ [ ] $6\frac{2}{3}$

Hint:
When the whole numbers are equal, compare the fractions.

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

Solution:

$6\frac{1}{3}$ |<| $6\frac{2}{3}$

FCM05

Find a common denominator then compare using <,>, or =.

Sample Problem:

$$\frac{1}{5} \;[\; ? \;] \; \frac{6}{10}$$

Hint:
Reduce both fractions to lowest terms to find a common denominator.

$$\frac{1}{5} \quad \frac{1}{5} \qquad \frac{6}{10} \cdot \frac{2}{2} \quad \frac{3}{5} \qquad \frac{1}{5} \quad \frac{3}{5}$$

Solution:

$$\frac{1}{5} \; |<| \; \frac{6}{10}$$

FCM06

Find a common denominator then compare using <,>, or =.

Sample Problem:

$$\frac{2}{3} \; [\;] \; \frac{8}{12}$$

Hint:
Reduce both fractions to lowest terms to find a common denominator.

$$\frac{2}{3} \cdot \frac{2}{3} \qquad \frac{8}{12} \cdot \frac{4}{4} \cdot \frac{2}{3} \qquad \frac{2}{3} \cdot \frac{2}{3}$$

Solution:

$$\frac{2}{3} \; |= | \; \frac{8}{12}$$

FCM07

Find a common denominator then compare using <,>, or =.

Sample Problem:

$$6\frac{1}{3} \ [\ ] \ 6\frac{4}{6}$$

Hint:
Reduce both fractions to lowest terms to find a common denominator.

$$\frac{1}{3} \quad \frac{1}{3} \qquad \frac{4}{6} \div \frac{2}{2} \quad \frac{2}{3} \qquad \frac{1}{3} \quad \frac{2}{3}$$

Solution:

$$6\frac{1}{3} \ [<] \ 6\frac{4}{6}$$

Fractions: Improper and Mixed Numbers

FMX01

Is this a proper fraction?

Sample Problem:

$\frac{5}{4}$ [ ]

Hint:
A fraction is proper if the numerator is less than the denominator.

$5 > 4$ Improper fraction

Solution:

$\frac{5}{4}$ |no |

FMX02

Change this improper fraction to a whole or mixed number. Reduce your answer to lowest terms.

Sample Problem:

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

Hint:

Divide the numerator by the denominator to get the whole number. Place the remainder over the denominator to get the fraction.

$$5)\overline{12} \quad \frac{2 \ r \ 2}{} = 2\frac{2}{5}$$

Solution:

$$\frac{12}{5} = [2]\frac{[2]}{[5]}$$

FMX03

Change this improper fraction to a whole or mixed number.   Reduce your answer to lowest terms.

Sample Problem:

$$\frac{42}{8} = [\ ]\frac{[\ ]}{[\ ]}$$

Hint:

Divide the numerator by the denominator to get the whole number.   Place the remainder over the denominator to get the fraction.   Then reduce.

$$\frac{5\ r\ 2}{8)42} = 5\frac{2}{8} = 5\frac{1}{4}$$

Solution:

$$\frac{42}{8} = [5]\frac{[1]}{[4]}$$

FMX04

Change this mixed number to an improper fraction.

Sample Problem:

$$3\frac{2}{3} = \frac{[\ ]}{3}$$

Hint:
Multiply the whole number by the denominator, then add the numerator.   Place this number over the denominator.

$$3\frac{2}{3} \qquad 3\frac{2}{3}$$

$$3 \cdot 3 = 9 \qquad 9 + 2 = 11 \qquad \frac{11}{3}$$

Solution:

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

FMX05

Change this mixed number to an equivalent mixed number.

Sample Problem:

$$3\frac{2}{3} = 2\frac{[\,]}{3}$$

Hint:
Rename the whole number as 1 less plus a fraction equal to one.   Then add the fractions.

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

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

Solution:

$$3\frac{2}{3} = 2\frac{|5|}{3}$$

Fractions: Finding the Fraction of a Number

FOF01

Find this fraction of the whole number.

Sample Problem:

$\frac{1}{3}$ of 18 = []

Hint:
When the numerator equals one, divide the whole number by the denominator.

18 , 3 = 6

Solution:

$\frac{1}{3}$ of 18 = |6|

FOF02

Find this fraction of the whole number.

Sample Problem:

$\frac{1}{10}$ of 50 = []

Hint:
When the numerator equals one, divide the whole number by the denominator.

50 . 10 – 5

Solution:

$\frac{1}{10}$ of 50 = |5|

FOF03

Find this fraction of the whole number.

Sample Problem:

$\frac{2}{5}$ of 20 = []

Hint:

Divide the whole number by the denominator, then multiply by the numerator.

20 , 5 = 4   4 · 2 = 8

Solution:

$\frac{2}{5}$ of 20 = |8|

FAS22

Do this subtraction.   Reduce your answer to lowest terms.

Sample Problem:

$$1 - \frac{6}{7} \cdot \frac{[]}{[]}$$

Hint:
Rename the 1 as a fraction equal to one.   This fraction should have the same numerator and denominator as the other fraction.   Then subtract.

$$1 - \frac{7}{7} \qquad \frac{7}{7} - \frac{6}{7} - \frac{1}{7}$$

Solution:

$$1 - \frac{6}{7} = \frac{[1]}{[7]}$$

FAS01

Add these fractions.

$$\frac{1}{3} + \frac{1}{3} = \frac{[]}{[]}$$

Hint:
Add the numerators.   The denominators stay the same.

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

Solution:

$$\frac{1}{3} + \frac{1}{3} = \frac{[2]}{[3]}$$

FAS02

Add these fractions.

Sample Problem:

$$\frac{1}{3}$$
$$+\frac{1}{3}$$
$$\frac{[]}{[]}$$

Hint:
Add the numerators.   The denominators stay the same.

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

Solution:

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

FAS03

Add these fractions.   Reduce your answer to lowest terms.

Sample Problem:

$$\frac{1}{4} + \frac{1}{4} = \frac{[]}{[]}$$

Hint:
Add the numerators.   Divide the numerator and denominator by the same number to reduce.

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

Solution:

$$\frac{1}{4} + \frac{1}{4} = \frac{[1]}{[2]}$$

FML01

Multiply these numbers.

Sample Problem:

$$\frac{2}{5} \cdot 10 = []$$

Hint:

Multiply the whole number by the numerator.   Then divide by the denominator.

$$2 \cdot 10 = 20 \qquad 20 \div 5 = 4$$

Solution:

$$\frac{2}{5} \cdot 10 = |4|$$

FAS04

Add these fractions.   Reduce your answer to lowest terms.

Sample Problem:

$$\begin{array}{r} \dfrac{1}{4} \\[4pt] + \dfrac{1}{4} \\ \hline \dfrac{[\,]}{[\,]} \end{array}$$

Hint:

Add the numerators.   Divide the numerator and denominator by the same number to reduce.

$$\begin{array}{r} \dfrac{1}{4} \\[4pt] + \dfrac{1}{4} \\ \hline \dfrac{2}{4} \end{array} \qquad \dfrac{2}{4} \cdot \dfrac{2}{2} \ \dfrac{1}{2}$$

Solution:

$$\begin{array}{r} \dfrac{1}{4} \\[4pt] + \dfrac{1}{4} \\ \hline \dfrac{|1|}{|2|} \end{array}$$

FAS05

Do this subtraction.

Sample Problem:

$$\frac{2}{3} - \frac{1}{3} = \frac{[\;]}{[\;]}$$

Hint:
Subtract the numerators.   The denominators stay the same.

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

Solution:

$$\frac{2}{3} - \frac{1}{3} = \frac{[1]}{[3]}$$

FAS06

Do this subtraction.

Sample Problem:

$$\begin{array}{r} \frac{2}{3} \\ -\ \frac{1}{3} \\ \hline \frac{[]}{[]} \end{array}$$

Hint:
Subtract the numerators.   The denominators stay the same.

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

Solution:

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

FAS21

Do this subtraction.   Reduce your answer to lowest terms.

Sample Problem:

$$- \frac{1 \quad \frac{6}{7}}{\frac{[\ ]}{[\ ]}}$$

Hint:
Rename the 1 as a fraction equal to one.   This fraction should have the same numerator and denominator as the other fraction.   Then subtract.

$$1 - \frac{7}{7} \quad - \quad \frac{\frac{7}{7}}{\frac{6}{7}} = \frac{1}{7}$$

Solution:

$$- \frac{1 \quad \frac{6}{7}}{\frac{|1|}{|7|}}$$

Do this subtraction.   Reduce your answer to lowest terms.

Sample Problem:

$$\frac{7}{8} \quad \frac{1}{8} \quad \frac{[]}{[]}$$

Hint:

Subtract the numerators.   Divide the numerator and denominator by the same number to reduce.

$$\frac{7}{8} \quad \frac{1}{8} \quad \frac{6}{8} \qquad \frac{6}{8} \quad \frac{2}{2} \quad \frac{3}{4}$$

Solution:

$$\frac{7}{8} \quad - \quad \frac{1}{8} \quad \frac{[3]}{[4]}$$

FAS08

Do this subtraction.   Reduce your answer to lowest terms.

Sample Problem:

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

Hint:
Subtract the numerators.   Divide the numerator and denominator by the same number to reduce.

$$\frac{7}{8} - \frac{1}{8} = \frac{6}{8} \quad \frac{6}{8} \div \frac{2}{2} = \frac{3}{4}$$

Solution:

$$\frac{7}{8} - \frac{1}{8} = \frac{|3|}{|4|}$$

FAS09

Add these fractions.   Write your answer as a mixed number reduced to lowest terms.

Sample Problem:

$$\frac{7}{8} + \frac{5}{8} = \boxed{}\frac{[\ ]}{[\ ]}$$

Hint:
Add the numerators.

$$\frac{7}{8} + \frac{5}{8} = \frac{12}{8}$$

Divide the numerator by the denominator to make a mixed number.   Then reduce.

$$8\overline{)12} = 1\ r\ 4 \quad = \quad 1\frac{4}{8} \quad = \quad 1\frac{1}{2}$$

Solution:

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

FAS10

Add these fractions.   Write your answer as a mixed number reduced to lowest terms.

Sample Problem:

$$\begin{array}{r} \dfrac{7}{8} \\[4pt] +\ \dfrac{5}{8} \\ \hline [\ ]\ \dfrac{[\ ]}{[\ ]} \end{array}$$

Hint:
Add the numerators.

$$\begin{array}{r} \dfrac{7}{8} \\[4pt] +\ \dfrac{5}{8} \\ \hline \dfrac{12}{8} \end{array}$$

Divide the numerator by the denominator to make a mixed number.   Then reduce.

$$\begin{array}{l} \overset{1\ r\ 4}{8)\overline{12}} \quad = \quad 1\dfrac{4}{8} \quad = \quad 1\dfrac{1}{2} \end{array}$$

Solution:

$$\begin{array}{r} \dfrac{7}{8} \\[4pt] +\ \dfrac{5}{8} \\ \hline |1|\dfrac{|1|}{|2|} \end{array}$$

DAS03

Do this subtraction.

Sample Problem:

```
  9.8
-   .1
─────
   []
```

Hint:
Subtract 1 from the tenths.   The tenths are directly to the right of the decimal point. The whole number stays the same.

```
  9 . 8
-   . 1
─────────
  9 . 7
```

Solution:

```
  9.8
-   .1
─────
 [9.7]
```

FAS11

Add these mixed numbers.   Reduce your answer to lowest terms.

Sample Problem:

$$\frac{1}{4} + 2\frac{1}{4} \rightarrow \boxed{}\frac{[]}{[]}$$

Hint:
Add the fractions and reduce.   Then add the whole numbers.

$$\frac{1}{4} + 2\frac{1}{4} \rightarrow \boxed{}\frac{2}{4} = \boxed{}\frac{1}{2}$$

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

Solution:

$$\frac{1}{4} + 2\frac{1}{4} \rightarrow |3|\frac{|1|}{|2|}$$

FAS12

Add these mixed numbers.   Reduce your answer to lowest terms.

Sample Problem:

$$1 \frac{1}{4}$$
$$+ \quad 2 \frac{1}{4}$$
$$[] \frac{[]}{[]}$$

Hint:
Add the fractions and reduce.   Then add the whole numbers.

$$1 \frac{1}{4}$$
$$+ \quad 2 \frac{1}{4}$$
$$[] \frac{2}{4} = [] \frac{1}{2}$$

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

Solution:

$$1 \frac{1}{4}$$
$$+ \quad 2 \frac{1}{4}$$
$$|3| \frac{|1|}{|2|}$$

DML02

Multiply these numbers.

Sample Problem:

```
  0.5
·    9
─────
   []
```

Hint:
Multiply the factors without the zero.   The zero is a place holder for the decimal.   When 1 factor is a tenth and the other is a whole number, the factors have a total of 1 digit right of the decimal point.   The product will also have 1 digit right of the decimal point.

```
  0.5
·    9    =  4.5
─────
   45
```

Solution:

```
  0.5
·    9
─────
 [4.5]
```

FAS13

Do this subtraction.   Reduce your answer to lowest terms.

Sample Problem:

$$3\frac{3}{4} + 1\frac{1}{4} \rightarrow []\frac{[]}{[]}$$

Hint:
Subtract the fractions and reduce.   Then subtract the whole numbers.

$$3\frac{3}{4} + 1\frac{1}{4} \rightarrow []\frac{2}{4} = []\frac{1}{2}$$

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

Solution:

$$3\frac{3}{4} + 1\frac{1}{4} \rightarrow |2|\frac{|1|}{|2|}$$

FAS14

Do this subtraction.   Reduce your answer to lowest terms.

Sample Problem:

$$3 \frac{3}{4}$$
$$- \ 1 \frac{1}{4}$$
$$[] \frac{[]}{[]}$$

Hint:
Subtract the fractions and reduce.   Then subtract the whole numbers.

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

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

Solution:

$$3 \frac{3}{4}$$
$$- \ 1 \frac{1}{4}$$
$$[2] \frac{[1]}{[2]}$$

FAS15

Do this subtraction.

Sample Problem:

$$6\frac{2}{3} - 4 = \square\frac{[]}{[]}$$

Hint:
Subtract the whole numbers.   The fraction stays the same.

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

Solution:

$$6\frac{2}{3} - 4 = 2\frac{|2|}{|3|}$$

Fractions: Multiplication

FAS16

Do this subtraction.

Sample Problem:

$$6 \frac{2}{3}$$
$$- \quad 4$$
$$[] \frac{[]}{[]}$$

Hint:
Subtract the whole numbers.   The fraction stays the same.

$$6 \frac{2}{3}$$
$$- \quad 4$$
$$2 \frac{2}{3}$$

Solution:

$$6 \frac{2}{3}$$
$$- \quad 4$$
$$|2| \frac{|2|}{|3|}$$

FAS17

Add these fractions.

Sample Problem:

$\xrightarrow{\frac{3}{8} \quad \frac{5}{8}}$ []

Hint:
Add the fractions to get a sum equal to 1.   Then add 1 to the whole number.

$\xrightarrow{\frac{3}{8} \quad \frac{5}{8}} \quad \xrightarrow{\frac{8}{8}} \quad \frac{8}{8} = 1$

4 + 1 = 5

Solution:

$\xrightarrow{\frac{3}{8} \quad \frac{5}{8}}$ |5|

FAS18

Add these fractions.

Sample Problem:

$$4 \frac{3}{8}$$
$$+ \quad \frac{5}{8}$$
$$[]$$

Hint:
Add the fractions to get a sum equal to 1.   Then add 1 to the whole number.

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

Solution:

$$4 \frac{3}{8}$$
$$+ \quad \frac{5}{8}$$
$$[5]$$

FAS19

Add these mixed numbers.   Reduce your answer to lowest terms.

Sample Problem:

$$7\frac{5}{8} + 1\frac{5}{8} = []\frac{[]}{[]}$$

Hint:
Add the fractions to get an improper fraction, then add the whole numbers.

$$7\frac{5}{8} + 1\frac{5}{8} = []\frac{10}{8}$$

$$7\frac{5}{8} + 1\frac{5}{8} = 8\frac{10}{8}$$

Divide the numerator by the denominator to make the improper fraction a mixed number.   Then reduce.

$$\frac{10}{8} = 8)\overline{10}^{\,1\,r\,2} = 1\frac{2}{8} = 1\frac{1}{4}$$

Add the whole numbers.

$$8\frac{10}{8} = 8 + 1\frac{1}{4} = 9\frac{1}{4}$$

Solution:

$$7\frac{5}{8} + 1\frac{5}{8} = 9\frac{|1|}{|4|}$$

FAS20

Add these mixed numbers.   Reduce your answer to lowest terms.

Sample Problem:

$$7 \frac{5}{8}$$
$$+ \ 1 \frac{5}{8}$$
$$[] \ \frac{[]}{[]}$$

Hint:
Add the fractions to get an improper fraction, then add the whole numbers.

$$7 \frac{5}{8} \qquad 7 \frac{5}{8}$$
$$+ \ 1 \frac{5}{8} \qquad + \ 1 \frac{5}{8}$$
$$[] \frac{10}{8} \qquad 8 \frac{10}{8}$$

Divide the numerator by the denominator to make the improper fraction a mixed number.   Then reduce.

$$\frac{10}{8} = \ \overset{1 \ r \ 2}{8)10} \ = \ 1\frac{2}{8} = \ 1\frac{1}{4}$$

Add the whole numbers.

$$8\frac{10}{8} \qquad \begin{array}{r} 8 \\ + \ 1 \frac{1}{4} \\ \hline 9 \ \frac{1}{4} \end{array}$$

Solution:

$$7 \frac{5}{8}$$
$$+ \ 1 \frac{5}{8}$$
$$|9| \frac{|1|}{|4|}$$

FAS23

Do this subtraction.   Reduce your answer to lowest terms.

Sample Problem:

$$8$$
$$- \frac{4}{7}$$
$$[] \frac{[]}{[]}$$

Hint:
Rename the whole number as 1 less, plus a fraction equal to 1.   This fraction should
have the same numerator and denominator as the other fraction.

$$8 - 7 + 1$$

$$8 - 7 + \frac{7}{7}$$

Subtract the fractions.   The whole number stays the same.

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

Solution:

$$8$$
$$- \frac{4}{7}$$
$$|7| \frac{|3|}{|7|}$$

FAS24

Do this subtraction.   Reduce your answer to lowest terms.

Sample Problem:

$$8 \frac{4}{7} = \boxed{ } \frac{[ ]}{[ ]}$$

Hint:
Rename the whole number as 1 less, plus a fraction equal to 1.   This fraction should have the same numerator and denominator as the other fraction.

$$8 = 7 + 1$$

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

Subtract the fractions.   The whole number stays the same.

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

Solution:

$$8 \frac{4}{7} = [7] \frac{[3]}{[7]}$$

FAS25

Do this subtraction.

Sample Problem:

```
    12
       3
-  5 ───
       7
   ┌─────
       []
   [] ──
       []
```

Hint:
Rename the first whole number as 1 less, plus a fraction equal to 1.   This fraction should have the same numerator and denominator as the other fraction.

12 = 11 + 1

12 = 11 + $\frac{7}{7}$

Subtract the fractions.   Then subtract the whole numbers.

```
        7                 7
   11 ───          11  ───
        7                 7
        3                 3
-   5 ───         -   5 ───
        7                 7
   ┌──────           ┌──────
        4                 4
   [] ───           6  ───
        7                 7
```

Solution:

```
    12
       3
-  5 ───
       7
   ┌──────
          |4|
   |6|────
          |7|
```

Do this subtraction.

Sample Problem:

$12 - 5\frac{3}{7} = [\ ]\frac{[\ ]}{[\ ]}$

Hint:
Rename the first whole number as 1 less, plus a fraction equal to 1.   This fraction should have the same numerator and denominator as the other fraction.

$12 = 11 + 1$

$12 = 11 \frac{7}{7}$

Subtract the fractions.   Then subtract the whole numbers.

$11\frac{7}{7} - 5\frac{3}{7} = [\ ]\frac{4}{7}$

$11\frac{7}{7} - 5\frac{3}{7} = 6\frac{4}{7}$

Solution:

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

FAS27

Rename the first mixed number so that you can subtract.   Reduce your answer to lowest terms.

Sample Problem:

$$3\frac{1}{4} + \frac{3}{4} \rightarrow \boxed{}\frac{[]}{[]}$$

Hint:
Rename the first whole number as 1 less, plus a fraction equal to 1.   This fraction should have the same numerator and denominator as the other fraction.   Then add the fractions.

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

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

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

Subtract the fractions and reduce.   Then subtract the whole numbers.

$$2\frac{5}{4} + \frac{3}{4} \rightarrow \boxed{}\frac{2}{4} = \boxed{}\frac{1}{2}$$

$$2\frac{5}{4} + \frac{3}{4} \rightarrow \frac{1}{2}$$

Solution:

$$3\frac{1}{4} + \frac{3}{4} \rightarrow \boxed{}\frac{|1|}{|2|}$$

FAS28

Rename the first mixed number so that you can subtract.   Reduce your answer to lowest terms.

Sample Problem:

$$3 \frac{1}{4}$$
$$- \ 1 \frac{3}{4}$$
$$[] \frac{[]}{[]}$$

Hint:

Rename the first whole number as 1 less, plus a fraction equal to 1.   This fraction should have the same numerator and denominator as the other fraction.   Then add the fractions.

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

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

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

Subtract the fractions and reduce.   Then subtract the whole numbers.

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

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

Solution:

$$3 \frac{1}{4}$$
$$- \ 1 \frac{3}{4}$$
$$[1] \frac{[1]}{[2]}$$

FAS29

Find a common denominator then add.   Reduce your answer to lowest terms.

Sample Problem:

$$\begin{array}{r} \dfrac{1}{5} \\ +\dfrac{3}{10} \\ \hline \dfrac{[]}{[]} \end{array}$$

Hint:
Since the first denominator is a factor of the other, use the larger denominator as the common denominator.   Multiply to rename the first fraction.

Common denominator   = 10

$$\frac{1}{5} \cdot \frac{2}{2} = \frac{2}{10} \qquad \frac{3}{10} = \frac{3}{10} \ .$$

Add the fractions, then reduce.

$$\begin{array}{r} \dfrac{2}{10} \\ +\dfrac{3}{10} \\ \hline \dfrac{5}{10} \end{array} = \frac{1}{2}$$

Solution:

$$\begin{array}{r} \dfrac{1}{5} \\ +\dfrac{3}{10} \\ \hline \dfrac{|1|}{|2|} \end{array}$$

FAS30

Find a common denominator then add.   Reduce your answer to lowest terms.

Sample Problem:

$$\frac{1}{5} + \frac{3}{10} = \frac{[]}{[]}$$

Hint:

Since the first denominator is a factor of the other, use the larger denominator as the common denominator.   Multiply to rename the first fraction.

Common denominator   = 10

$$\frac{1}{5} \cdot \frac{2}{2} = \frac{2}{10} \qquad \frac{3}{10} = \frac{3}{10}$$.

Add the fractions, then reduce.

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

Solution:

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

FAS31

Find a common denominator then add.   Reduce your answer to lowest terms.

Sample Problem:

$$
\begin{array}{r}
\dfrac{5}{8} \\
+\ \dfrac{7}{16} \\
\hline
[\,]\ \dfrac{[\,]}{[\,]}
\end{array}
$$

Hint:

Since the first denominator is a factor of the other, use the larger denominator as the common denominator.   Multiply to rename the first fraction.

Common denominator   = 16

$$
\frac{5}{8} \cdot \frac{2}{2} = \frac{10}{16} \qquad \frac{7}{16} = \frac{7}{16} \;.
$$

Add the fractions, then divide the numerator by the denominator to express the answer as a mixed number.

$$
\begin{array}{r}
\dfrac{10}{16} \\
+\ \dfrac{7}{16} \\
\hline
\dfrac{17}{16}
\end{array}
\qquad
16\overline{)17}^{\ 1\ r\ 1}
\qquad = 1\frac{1}{16}
$$

Solution:

$$
\begin{array}{r}
\dfrac{5}{8} \\
+\ \dfrac{7}{16} \\
\hline
1\frac{|1|}{|16|}
\end{array}
$$

FAS33

Find a common denominator then add.   Reduce your answer to lowest terms.

Sample Problem:

$$6 \frac{1}{4}$$
$$+ \quad 2\frac{5}{12}$$
$$[] \frac{[]}{[]}$$

Hint:
Since the first denominator is a factor of the other, use the larger denominator as the common denominator.   Multiply to rename the first fraction.

Common denominator   = 12

$$\frac{1}{4} \cdot \frac{3}{3} \quad \frac{3}{12} \qquad \frac{5}{12} \quad \frac{5}{12} \quad .$$

Add the fractions, and reduce.   Then add the whole numbers.

$$6\frac{3}{12}$$
$$+ \quad 2\frac{5}{12}$$
$$[]\frac{8}{12} = []\frac{2}{3}$$

$$6\frac{3}{12}$$
$$+ \quad 2\frac{5}{12}$$
$$8\frac{2}{3}$$

Solution:

$$6\frac{1}{4}$$
$$+ \quad 2\frac{5}{12}$$
$$|8| \frac{|2|}{|3|}$$

FAS34

Find a common denominator then add.   Reduce your answer to lowest terms.

Sample Problem:

$$6\frac{1}{4} + 2\frac{5}{8} = \square\frac{[]}{[]}$$

Hint:
Since the first denominator is a factor of the other, use the larger denominator as the common denominator.   Multiply to rename the first fraction.

Common denominator   = 12

$$\frac{1}{4} \cdot \frac{3}{3} = \frac{3}{12} \qquad \frac{5}{12} = \frac{5}{12}$$.

Add the fractions, and reduce.   Then add the whole numbers.

$$6\frac{3}{12} + 2\frac{5}{12} = \square\frac{8}{12} = \square\frac{2}{3}$$

$$6\frac{3}{12} + 2\frac{5}{12} = 8\frac{2}{3}$$

Solution:

$$6\frac{1}{4} + 2\frac{5}{8} = 8\frac{|2|}{|3|}$$

FAS35

Find a common denominator then subtract.   Reduce your answer to lowest terms.

Sample Problem:

$$\frac{3}{4}$$
$$-\frac{1}{8}$$
$$\frac{[\,]}{[\,]}$$

Hint:

Since the first denominator is a factor of the other, use the larger denominator as the common denominator.   Multiply to rename the first fraction.

Common denominator   = 8

$$\frac{3}{4} \cdot \frac{2}{2} \quad \frac{6}{8} \qquad \frac{1}{8} \quad \frac{1}{8}$$.

Subtract the fractions.

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

Solution:

$$\frac{3}{4}$$
$$-\frac{1}{8}$$
$$\frac{|5|}{|8|}$$

FAS36

Find a common denominator then subtract.   Reduce your answer to lowest terms.

Sample Problem:

$$\frac{3}{4} - \frac{1}{8} = \frac{[]}{[]}$$

Hint:
Since the first denominator is a factor of the other, use the larger denominator as the common denominator.   Multiply to rename the first fraction.

Common denominator   = 8

$$\frac{3}{4} \cdot \frac{2}{2} = \frac{6}{8} \qquad \frac{1}{8} = \frac{1}{8}$$.

Subtract the fractions.

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

Solution:

$$\frac{3}{4} - \frac{1}{8} = \frac{[5]}{[8]}$$

FAS37

Find a common denominator then subtract.   Reduce your answer to lowest terms.

Sample Problem:

$$10 \quad \frac{4}{7}$$
$$- \quad 4 \frac{5}{14}$$
$$[] \frac{[]}{[]}$$

Hint:

Since the first denominator is a factor of the other, use the larger denominator as the common denominator.   Multiply to rename the first fraction.

Common denominator   = 14

$$\frac{4}{7} \cdot \frac{2}{2} = \frac{8}{14} \qquad \frac{5}{14} \quad \frac{5}{14}$$

Subtract the fractions.   Then subtract the whole numbers.

$$10 \frac{8}{14} \qquad 10 \frac{8}{14}$$
$$- \quad 4 \frac{5}{14} \qquad - \quad 4 \frac{5}{14}$$
$$[] \frac{3}{14} \qquad 6 \frac{3}{14}$$

Solution:

$$10 \quad \frac{4}{7}$$
$$- \quad 4 \frac{5}{14}$$
$$|6| \frac{|3|}{|14|}$$

FAS38

Find a common denominator then subtract.   Reduce your answer to lowest terms.

Sample Problem:

$$10\frac{4}{7} - 4\frac{5}{14} = \square\frac{[\,]}{[\,]}$$

Hint:

Since the first denominator is a factor of the other, use the larger denominator as the common denominator.   Multiply to rename the first fraction.

Common denominator   = 14

$$\frac{4}{7} \cdot \frac{2}{2} = \frac{8}{14} \qquad \frac{5}{14} \quad \frac{5}{14}$$

.

Subtract the fractions.   Then subtract the whole numbers.

$$10\frac{8}{14} - 4\frac{5}{14} = \square\frac{3}{14}$$

$$10\frac{8}{14} - 4\frac{5}{14} = 6\frac{3}{14}$$

Solution:

$$10\frac{4}{7} - 4\frac{5}{14} = 6\frac{|3|}{|14\,|}$$

FAS39

Rename the first mixed number so you can subtract.   Reduce your answer to lowest terms.

Sample Problem:

$$9 \, \frac{1}{3}$$
$$- \; 4 \, \frac{7}{9}$$
$$[] \, \frac{[]}{[]}$$

Hint:
Since the first denominator is a factor of the other, use the larger denominator as the common denominator.   Multiply to rename the first fraction.

Common denominator   = 9

$$\frac{1}{3} \cdot \frac{3}{3} \quad \frac{3}{9} \qquad \frac{7}{9} \quad \frac{7}{9}$$

Rename the first whole number as 1 less, plus a fraction equal to 1.   This fraction should have the same numerator and denominator as the other fraction.   Then add the fractions.

$$9 \, \frac{3}{9} \rightarrow 8 + 1 + \frac{3}{9}$$

$$9 \, \frac{3}{9} \rightarrow 8 + \frac{9}{9} + \frac{3}{9}$$

$$9 \, \frac{3}{9} \rightarrow 8 + \frac{12}{9} = 8 \, \frac{12}{9}$$

Subtract the fractions, then subtract the whole numbers.

$$8 \, \frac{12}{9} \qquad 8 \, \frac{12}{9}$$
$$- \; 4 \, \frac{7}{9} \qquad - \; 4 \, \frac{7}{9}$$
$$[] \, \frac{5}{9} \qquad \quad 4 \, \frac{5}{9}$$

Solution:

$$9 \, \frac{1}{3}$$
$$- \; 4 \, \frac{7}{9}$$
$$|4| \, \frac{|5|}{|9|}$$

FAS40

Rename the first mixed number so you can subtract.   Reduce your answer to lowest terms.

Sample Problem:

$$9\frac{1}{3} - 4\frac{7}{9} = \boxed{}\frac{[\,]}{[\,]}$$

Hint:
Since the first denominator is a factor of the other, use the larger denominator as the common denominator.   Multiply to rename the first fraction.

Common denominator   = 9

$$\frac{1}{3} \quad \frac{3}{3} \quad \frac{3}{9} \qquad \frac{7}{9} \quad \frac{7}{9}$$

Rename the first whole number as 1 less, plus a fraction equal to 1.   This fraction should have the same numerator and denominator as the other fraction.   Then add the fractions.

$$9\frac{3}{9} \rightarrow 8 + 1 + \frac{3}{9}$$

$$9\frac{3}{9} \rightarrow 8 + \frac{9}{9} + \frac{3}{9}$$

$$9\frac{3}{9} \rightarrow 8 + \frac{12}{9} = 8\frac{12}{9}$$

Subtract the fractions, then subtract the whole numbers.

$$8\frac{12}{9} - 4\frac{7}{9} = \boxed{}\frac{5}{9}$$

$$8\frac{12}{9} - 4\frac{7}{9} = 4\frac{5}{9}$$

Solution:

$$9\frac{1}{3} - 4\frac{7}{9} = 4\frac{|5|}{|9|}$$

FML02

Find the missing denominator.

Sample Problem:

$$\frac{2}{[\;]} \cdot 10 = 4$$

Hint:

Multiply the whole number by the numerator.   This number divided by the denominator equals the product.

2 · 10 = 20

20 , [ ] = 4   20 , 5 = 4

Solution:

$$\frac{2}{[5]} \cdot 10 = 4$$

FML03

Multiply these fractions.   Reduce your answer to lowest terms.

Sample Problem:

$$\frac{2}{5} \cdot \frac{3}{4} = \frac{[]}{[]}$$

Hint:
Multiply the numerators.   Then multiply the denominators and reduce.

$$\frac{2}{5} \cdot \frac{3}{4} = \frac{6}{[]} \qquad \frac{2}{5} \cdot \frac{3}{4} = \frac{6}{20} = \frac{3}{10}$$

Solution:

$$\frac{2}{5} \cdot \frac{3}{4} = \frac{|3|}{|10|}$$

Decimals: Place Value

DPV01 **Convert tenths from a fraction to a decimal.   Numbers < 1.**
DPV02 **Convert hundredths from a fraction to a decimal.   Numbers < 1.**
DPV03 **Write fraction in tenths or hundredths as a decimal < 1.**
DPV04 **Convert a mixed number with tenths or hundredths to a decimal.   Numbers between 1 and 10.**
DPV05 **Convert tenths or hundredths from a decimal to a fraction < 1.   Numbers < 1.**
DPV06 **Convert tenths or hundredths > 1 from a decimal to a mixed number.   Numbers between 1 and 10.**
DPV07 **Convert tenths or hundredths from a decimal to a mixed number.   Number < 1 or from 1 to 10. Reducing required.**
DPV08 **Convert decimals from tenths to hundredths and vice versa. Numbers < 10.**
DPV11 **Show .1 more or less than a decimal in tenths or hundredths.   Numbers < 10.**
DPV12 **Show the decimal that comes between two numbers.   Tenths or hundredths.   Numbers < 10.**
DPV13 **Compare (< = >) two decimals with tenths.   Numbers < 10.   Same whole number.**
DPV14 **Compare (< = >) two decimals, with hundredths.   Numbers < 10.   Same whole number.**
DPV15 **Compare (< = >) decimals, one tenth and one hundredth.   Numbers < 1.   Tenths are equal.**
DPV18 **Convert thousandths from a fraction to a decimal.   Numbers < 1.**
DPV19 **Convert thousandths from a decimal to a fraction.   Numbers < 1.**
DPV20 **Convert thousandths from a decimal to a fraction.   Numbers < 1.**
DPV21 **Convert a decimal from tenths or hundredths to thousandths.   Numbers < 1.**
DPV22 **Write decimals from basic fractions < 1.   Round to nearest hundredth.**
DPV23 **Write decimals from fractions with the denominator 8.**
DPV24 **Write decimals from fractions with the denominator 5 or 20.**

FML04

Multiply these fractions.   Reduce your answer to lowest terms.

Sample Problem:

$$\frac{4}{7} \cdot \frac{3}{10} = \frac{[]}{[]}$$

Hint:
Multiply the numerators.   Then multiply the denominators and reduce.

$$\frac{4}{7} \quad \frac{3}{10} \quad \frac{12}{[]} \qquad \frac{4}{7} \quad \frac{3}{10} \quad \frac{12}{70} \quad \frac{6}{35}$$

Solution:

$$\frac{4}{7} \quad \frac{3}{10} \quad \frac{|6|}{|35|}$$

FML05

Cancel common factors then multiply.

Sample Problem:

$$\frac{5}{6} \cdot \frac{6}{7} \cdot \frac{[\,]}{[\,]}$$

Hint:
When one numerator equals the other denominator, those two numbers cancel each other out.

$$\frac{5}{6} \cdot \frac{6}{7} = \frac{5}{6} \cdot \frac{\overset{1}{6}}{7} = \frac{5}{1} \cdot \frac{1}{7} = \frac{5}{7}$$

Solution:

$$\frac{5}{6} \cdot \frac{6}{7} \cdot \frac{|5|}{|7|}$$

FML06

Cancel common factors then multiply.

Sample Problem:

$$\frac{2}{3} \cdot \frac{6}{8} = \frac{[]}{[]}$$

Hint:
When a numerator and denominator have common factors, divide each by the same number to reduce.

$$\frac{2}{3} \cdot \frac{6}{8} = \frac{2}{3} \cdot \frac{\overset{2}{6}}{8} = \frac{2}{1} \cdot \frac{2}{8}$$

Reduce again as needed, then multiply.

$$\frac{2}{1} \cdot \frac{2}{8} = \frac{2}{1} \cdot \frac{\overset{1}{2}}{\underset{4}{8}} = \frac{1}{1} \cdot \frac{2}{4} = \frac{2}{4} = \frac{1}{2}$$

Solution:

$$\frac{2}{3} \cdot \frac{6}{8} = \frac{[1]}{[2]}$$

FML07

Multiply these fractions.   Reduce your answer to lowest terms.

Sample Problem:

$$\frac{1}{8} \cdot 2\frac{2}{3} = \frac{[\,]}{[\,]}$$

Hint:
Rename the mixed number as an improper fraction.   Multiply the whole number by the denominator, then add the numerator.   Place this number over the denominator.

$$2\frac{2}{3} \qquad 2\frac{2}{3}$$

$$2 \cdot 3 = 6 \qquad 6 + 2 = 8 \qquad \frac{8}{3}$$

Reduce and multiply.

$$\frac{1}{8} \cdot \frac{8}{3} = \frac{1}{8} \cdot \frac{\overset{1}{8}}{3} = \frac{1}{1} \cdot \frac{1}{3} = \frac{1}{3}$$

or

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

Solution:

$$\frac{1}{8} \cdot 2\frac{2}{3} = \frac{|1|}{|3|}$$

FML08

Multiply these mixed numbers.   Reduce your answer to lowest terms.

Sample Problem:

$$3\frac{2}{3} \cdot 4\frac{1}{5} = [\,]\frac{[\,]}{[\,]}$$

Hint:
Rename the mixed numbers as improper fractions.   Multiply the whole number by the denominator, then add the numerator.   Place this number over the denominator.

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

$3 \cdot 3 = 9 \qquad 9 + 2 = 11$

$$4\frac{1}{5} \qquad 4\frac{1}{5} \qquad = \frac{21}{5}$$

$4 \cdot 5 = 20 \qquad 20 + 1 = 21$

Reduce and multiply.

$$\frac{11}{3} \cdot \frac{21}{5} = \frac{11}{3} \cdot \frac{\overset{7}{21}}{5} = \frac{11}{1} \cdot \frac{7}{5} = \frac{77}{5}$$

Put the answer in the form of a mixed number by dividing the numerator by the denominator.

$$\frac{15\ r\ 2}{5)\,77} = 15\frac{2}{5}$$

Solution:

$$3\frac{2}{3} \cdot 4\frac{1}{5} = 15\frac{[2]}{[5]}$$

Fractions: Division

FDV01 **Give the reciprocal of a whole number or fraction.   (Can be improper)**
FDV02 **Give the reciprocal of a mixed number.**
FDV03 **Divide two lowest terms fractions <1.   No reducing.   Quotient <1.**
FDV04 **Divide two lowest terms fractions <1.   Easily reduced.**
FDV05 **Divide a whole number by a fraction.   Reducing required.**
FDV06 **Divide a fraction by a whole number.   Reducing required.**
FDV07 **Divide a mixed number by a fraction.**
FDV08 **Divide a fraction by a mixed number.   Reducing required.**
FDV09 **Divide two mixed numbers.   Reducing required.**

FDV01

Find the reciprocal of this fraction number.

Sample Problems:

$$\frac{3}{4} \text{ is } \frac{[\,]}{[\,]} \qquad \text{or} \qquad 8 \text{ is } \frac{[\,]}{[\,]}$$

Hint:
Turn a fraction upside down to get the reciprocal.

The reciprocal of $\frac{3}{4}$ is $\frac{4}{3}$

The reciprocal of a whole number is 1 over that number.

The reciprocal of 8 is $\frac{1}{8}$

Solution:s

$$\frac{3}{4} \text{ is } \frac{[\,4\,]}{[\,3\,]} \qquad \text{or} \qquad 8 \text{ is } \frac{|\,1\,|}{|\,8\,|}$$

FDV02

Find the reciprocal of this mixed number.

Sample Problem:

$2\dfrac{5}{6}$ is $\dfrac{[\,]}{[\,]}$

Hint:
Rename the mixed number as an improper fraction.   Multiply the whole number by the denominator, then add the numerator.   Place this number over the denominator.

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

$2 \cdot 6 = 12$ $12 + 5 = 17$ $\dfrac{17}{6}$

Turn the improper fraction upside down to get the reciprocal.

The reciprocal of $\dfrac{17}{6}$ is $\dfrac{6}{17}$

Solution:

$2\dfrac{5}{6}$ is $\dfrac{[6]}{[17]}$

FDV03

Do this division.   Reduce your answer to lowest terms.

Sample Problem:

$$\frac{1}{5} \div \frac{3}{4} = \frac{[]}{[]}$$

Hint:
Multiply the first fraction by the reciprocal of the second fraction.

$$\frac{1}{5} \div \frac{3}{4} = \frac{1}{5} \cdot \frac{4}{3} = \frac{4}{15}$$

Solution:

$$\frac{1}{5} \div \frac{3}{4} = \frac{|4|}{|15|}$$

FDV04

Do this division.   Simplify by canceling common factors.   Reduce your answer to lowest terms.

Sample Problem:

$$\frac{2}{9} \cdot \frac{2}{5} = \frac{[\,]}{[\,]}$$

Hint:
Multiply the first fraction by the reciprocal of the second fraction.

$$\frac{2}{9} \cdot \frac{2}{5} = \frac{2}{9} \cdot \frac{5}{2}$$

When one numerator equals the other denominator, those two numbers cancel each other out.

$$\frac{2}{9} \cdot \frac{5}{2} = \frac{\overset{1}{2}}{9} \cdot \frac{5}{\underset{1}{2}} = \frac{1}{9} \cdot \frac{5}{1} = \frac{5}{9}$$

Solution:

$$\frac{2}{9} \cdot \frac{2}{5} = \frac{[5]}{[9]}$$

FDV05

Do this division.   Reduce your answer to lowest terms.

Sample Problem:

$$5 \cdot \frac{3}{5} = []\frac{[]}{[]}$$

Hint:
Rename the whole number as a fraction with a denominator of 1.   Multiply this fraction by the reciprocal of the second fraction.

$$5 \cdot \frac{3}{5} = \frac{5}{1} \cdot \frac{5}{3} = \frac{25}{3}$$

Put the answer in the form of a mixed number by dividing the numerator by the denominator.

$$3)\overline{25} \quad ^{8\ r\ 1} = 8\frac{1}{3}$$

Solution:

$$5 \cdot \frac{3}{5} = [8]\frac{[1]}{[3]}$$

FDV06

Do this division.   Reduce your answer to lowest terms.

Sample Problem:

$$\frac{2}{3} \div 4 = \frac{[\,]}{[\,]}$$

Hint:
Rename the whole number as a fraction with a denominator of 1.   Multiply the first fraction by the reciprocal of the second fraction.

$$\frac{2}{3} \div 4 \;=\; \frac{2}{3} \div \frac{4}{1} \;=\; \frac{2}{3} \cdot \frac{1}{4}$$

Reduce and multiply.

$$\frac{2}{3} \cdot \frac{1}{4} = \frac{\overset{1}{2}}{3} \cdot \frac{1}{\underset{2}{4}} = \frac{1}{3} \cdot \frac{1}{2} = \frac{1}{6}$$

or

$$\frac{2}{3} \cdot \frac{1}{4} = \frac{2}{12} = \frac{1}{6}$$

Solution:

$$\frac{2}{3} \div 4 = \frac{[1]}{[6]}$$

FDV07

Do this division.   Reduce your answer to lowest terms.

Sample Problem:

$$2\frac{2}{3} \div \frac{3}{5} = []\frac{[]}{[]}$$

Hint:
Rename the mixed number as an improper fraction.   Multiply the whole number by the denominator, then add the numerator.   Place this number over the denominator.

$$2\frac{2}{3} \qquad 2\frac{2}{3}$$

$$2 \cdot 3 = 6 \qquad 6 + 2 = 8 \qquad \frac{8}{3}$$

Multiply this improper fraction by the reciprocal of the second fraction.

$$\frac{8}{3} \div \frac{3}{5} = \frac{8}{3} \cdot \frac{5}{3} = \frac{40}{9}$$

Put the answer in the form of a mixed number by dividing the numerator by the denominator.

$$\begin{array}{r} 4\ r\ 4 \\ 9)\overline{40} \end{array} = 4\frac{4}{9}$$

Solution:

$$2\frac{2}{3} \div \frac{3}{5} = [4]\frac{[4]}{[9]}$$

FDV08

Do this division.   Reduce your answer to lowest terms.

Sample Problem:

$$\frac{3}{4} \div 4\frac{1}{2} = \frac{[]}{[]}$$

Hint:
Rename the mixed number as an improper fraction.   Multiply the whole number by the denominator, then add the numerator.   Place this number over the denominator.

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

$$4 \cdot 2 = 8 \qquad 8 + 1 = 9 \qquad \frac{9}{2}$$

Multiply the first fraction by the reciprocal of the second fraction.

$$\frac{3}{4} \div \frac{9}{2} = \frac{3}{4} \cdot \frac{2}{9}$$

Reduce and multiply.

$$\frac{3}{4} \cdot \frac{2}{9} = \frac{\overset{1}{3}}{4} \cdot \frac{2}{\underset{3}{9}} = \frac{1}{4} \cdot \frac{2}{3}$$

$$\frac{1}{4} \cdot \frac{2}{3} = \frac{1}{\underset{2}{4}} \cdot \frac{\overset{1}{2}}{3} = \frac{1}{2} \cdot \frac{1}{3} = \frac{1}{6}$$

or

$$\frac{3}{4} \cdot \frac{2}{9} = \frac{6}{36} = \frac{1}{6}$$

Solution:

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

FDV09

Divide these mixed numbers.   Reduce your answer to lowest terms.

Sample Problem:

$$1\frac{3}{5} \div 3\frac{3}{5} = \frac{[]}{[]}$$

Hint:
Rename the mixed numbers as improper fractions.   Multiply the whole number by the
denominator, then add the numerator.   Place this number over the denominator.

$$1\frac{3}{5} \qquad 1\frac{3}{5} \qquad = \frac{8}{5}$$

1 · 5 = 5   5 + 3 = 8

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

3 · 5 = 15   15 + 3 = 18

Multiply the first fraction by the reciprocal of the second fraction.

$$\frac{8}{5} \div \frac{18}{5} = \frac{8}{5} \cdot \frac{5}{18}$$

Reduce and multiply.

$$\frac{8}{5} \cdot \frac{5}{18} = \frac{8}{5} \cdot \frac{\overset{1}{5}}{18} = \frac{8}{1} \cdot \frac{1}{18}$$

$$\frac{8}{1} \cdot \frac{1}{18} = \frac{\overset{4}{8}}{1} \cdot \frac{1}{\underset{9}{18}} = \frac{4}{1} \cdot \frac{1}{9} = \frac{4}{9}$$

Solution:

$$1\frac{3}{5} \div 3\frac{3}{5} = \frac{|4|}{|9|}$$

Change this fraction to a decimal.

Sample Problem:

$\frac{3}{10}$ [ ]

Hint:
The numerator shows the number of tenths when the denominator equals 10.   Tenths have one digit to the right of the decimal point.

$\frac{3}{10}$ =   3 tenths   =   .3

Solution:

$\frac{3}{10}$ |.3|

Change this fraction to a decimal.

Sample Problem:

$$\frac{14}{100} = \boxed{}$$

Hint:
The numerator shows the number of hundredths when the denominator equals 100.
Hundredths have two digits to the right of the decimal point.

$$\frac{14}{100} = \quad 14 \text{ hundredths} \quad = \quad .14$$

Solution:

$$\frac{14}{100} = \boxed{.14}$$

DPV03

Change this fraction to a decimal.

Sample Problems:

$$\frac{3}{10} = [] \quad \text{or} \quad \frac{53}{100} = []$$

Hint:

The numerator shows the number of tenths when the denominator equals 10 and the number of hundredths when the denominator equals 100.   Tenths have one digit to the right of the decimal point.   Hundredths have two digits to the right of the decimal point.

$$\frac{3}{10} = \quad 3 \text{ tenths} \quad = \quad .3$$

or

$$\frac{53}{100} = \quad 53 \text{ hundredths} \quad = \quad .53$$

Solutions:

$$\frac{3}{10} = |.3| \quad \text{or} \quad \frac{53}{100} = |.53|$$

DPV04

Change this mixed number to a decimal.

Sample Problem:

$4\frac{9}{10} = []$

Hint:
The whole number is placed to the left of the decimal point.   The fraction shows tenths or hundredths, which are placed to the right of the decimal point.   Tenths have one digit to the right of the decimal point.   Hundredths have two digits to the right of the decimal point.

$4\frac{9}{10}$ = 4 and 9 tenths = 4.9

Solution:

$4\frac{9}{10} = |4.9|$

DPV05

Change this decimal to a fraction.

Sample Problems:

$.9 = \dfrac{[]}{[]}$ or $.61 = \dfrac{[]}{[]}$

Hint:

Change the tenths and hundredths to fractions.   Tenths have one digit to the right of the decimal point.   Change tenths to a fraction with a denominator of 10.

$.9 = 9 \text{ tenths} = \dfrac{9}{10}$

Hundredths have two digits to the right of the decimal point.   Change hundredths to a fraction with a denominator of 100.

$.61 = 61 \text{ hundredths} = \dfrac{61}{100}$

Solutions:

$.9 = \dfrac{|9|}{|10|}$ or $.61 = \dfrac{|61|}{|100|}$

DPV06

Change this decimal to a mixed number.

Sample Problems:

$7.2 = 7\dfrac{[\ ]}{[\ ]}$ or $8.56 = 8\dfrac{[\ ]}{[\ ]}$

Hint:

The whole number, left of the decimal, stays the same.   Change the tenths and hundredths to fractions.   Tenths have one digit to the right of the decimal point.   Change tenths to a fraction with a denominator of 10.

$7.2 = 7$ and 2 tenths $= 7\dfrac{2}{10}$

Hundredths have two digits to the right of the decimal point.   Change hundredths to a fraction with a denominator of 100.

$8.56 = 8$ and 56 hundredths $= 8\dfrac{56}{100}$

Solutions:

$7.2 = 7\dfrac{|2|}{|10|}$ or $8.56 = 8\dfrac{|56|}{|100|}$

DPV07

Change this decimal to a mixed number.

Sample Problems:

$4.5 = \boxed{}\dfrac{[\ ]}{[\ ]}$ or $7.35 = \boxed{}\dfrac{[\ ]}{[\ ]}$

Hint:
The whole number, left of the decimal, stays the same.   Change the tenths and hundredths to fractions.   Tenths have one digit to the right of the decimal point.   Change tenths to a fraction with a denominator of 10.   Divide the numerator and denominator by the same number to reduce.

$4.5 \;=\; 4 \text{ and } 5 \text{ tenths} \;=\; 4\dfrac{5}{10}$

$\dfrac{5}{10} \cdot \dfrac{5}{5} = \dfrac{1}{2} \qquad = 4\dfrac{1}{2}$

Hundredths have two digits to the right of the decimal point.   Change hundredths to a fraction with a denominator of 100.   Divide the numerator and denominator by the same number to reduce.

$7.35 \;=\; 7 \text{ and } 35 \text{ hundredths} \;=\; 7\dfrac{35}{100}$

$\dfrac{35}{100} \cdot \dfrac{5}{5} = \dfrac{7}{20} \qquad = 7\dfrac{7}{20}$

Solutions:

$4.5 = 4\dfrac{|1|}{|2|}$ or $7.35 = 7\dfrac{|7|}{|20|}$

DPV08

If the number is given in tenths, change it to hundredths.   If the number is given in hundredths, change it to tenths.

Sample Problems:

4.3 = []   or   7.80   =   []

Hint:

Hundredths have two digits right of the decimal point.   Tenths have one digit right of the decimal point.   Add an extra zero to change tenths to hundredths.

4.3 = 4.30

Take off the extra zero to change hundredths to tenths.

7.80 = 7.8

Solutions:

4.3 = |4.30| or   7.80   = |7.8|

DAS02

Add these numbers.

Sample Problem:

2.3 + .1 = []

Hint:
Add 1 to the tenths.   The tenths are directly to the right of the decimal point.   The whole number stays the same.

2.3 + .1 = 2 . 4

Solution:

2.3 + .1 = |2.4|

DPV09

Fill in the missing number.

Sample Problem:

2.5, 2.6, 2.7, []

Hint:

The numbers are increasing by tenths.   Add 1 tenth to the number that is just before the missing number.

2.7 + .1 = 2.8

Solution:

2.5, 2.6, 2.7, |2.8|

DPV10

Fill in the missing number.

Sample Problem:

0.78, [], 0.80, 0.81

Hint:
The numbers are increasing by hundredths.   Add 1 hundredth to the number that is just before the missing number.

0.78 + .01 = 0.79

Solution:

0.78, |0.79|, 0.80, 0.81

DPV11

Fill in the missing number.

Sample Problem:

2.57, 2.67, []

Hint:

The numbers are increasing by tenths.   Add 1 tenth to the number that is just before the missing number.

2.67 + .1 = 2.77

Solution:

2.57, 2.67, |2.77|

DPV12

Fill in the missing number.

Sample Problems:

6.7, 6.8, []   or   3.4, [], 3.42

Hint:
If the numbers are increasing by tenths.   Add 1 tenth to the number that is just before the missing number.

6.8 + .1 = 6.9

If the numbers are increasing by hundredths.   Add 1 hundredth to the number that is just before the missing number.

3.4 + .01 = 3.41

Solutions:

6.7, 6.8, |6.9| or   3.4, |3.41|, 3.42

DPV13

Use <,>, or = to compare these numbers.

Sample Problem:

8.6 [] 8.9

Hint:
When the whole numbers are equal, compare the tenths.

6 < 9

Solution:

8.6 |<| 8.9

DPV14

Use <,>, or = to compare these numbers.

Sample Problems:

6.72 [] 6.41

Hint:
When the whole numbers are equal, compare the hundredths.

72 > 41

Solution:

6.72 |>| 6.41

DPV15

Use <,>, or = to compare these numbers.

Sample Problems:

.49 [] .4

Hint:

Think of the tenth as a decimal with zero in the hundredths place.   Then compare the hundredths.

.49 = 49 hundredths

.4 = .40 =   40 hundredths

49 >   40

Solutions:

.49 |>| .4

DPV16

Write the sum as a decimal number.

Sample Problem:

$$4 + \frac{3}{10} + \frac{9}{100} = [\quad]$$
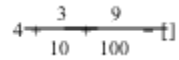
Hint:

The whole number is placed to the left of the decimal point. The fractions shows tenths and hundredths, which are placed to the right of the decimal point. Tenths have one digit to the right of the decimal point. Hundredths have two digits to the right of the decimal point.

$$4 \quad \frac{3}{10} \quad \frac{9}{100}$$

$$= \quad 4.39$$

$$4 \ . \ 3 \quad 9$$

Solution:

$$4 + \frac{3}{10} + \frac{9}{100} = [4.39\,]$$
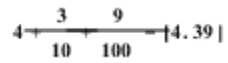
DPV17

Write the sum as a decimal number.

Sample Problem:

2 + .3 + .07 = []

Hint:

The whole number is placed to the left of the decimal point.   The tenths and hundredths are placed to the right of the decimal point.   Tenths have one digit to the right of the decimal point.   Hundredths have two digits to the right of the decimal point.

```
2      .3  .07
_       _   _      =    2.37
2  .   3    7
```

Solution:

2 + .3 + .07 = |2.37|

DAS01

Add these numbers.

Sample Problem:

```
    2.3
+    .1
─────────
    []
```

Hint:
Add 1 to the tenths.   The tenths are directly to the right of the decimal point.   The whole number stays the same.

```
   2 . 3
+    . 1
─────────
   2 . 4
```

Solution:

```
    2.3
+    .1
─────────
   [2.4]
```

DPV18

Write this fraction as a decimal.

Sample Problem:

$$\frac{13}{1000}$$

Hint:

The numerator shows the number of thousandths when the denominator equals 1000. Thousandths have three digits to the right of the decimal point. Use zeros, as needed to hold the decimal point.

$$\frac{13}{1000} = \quad 13 \ \text{thousandths} \quad = \quad .013$$

Solution:

$$\frac{13}{1000} = .013$$

DPV19

Write this decimal as a fraction.

Sample Problem:

$$.873 = \frac{[\,]}{[\,]}$$

Hint:

Thousandths have three digits to the right of the decimal point.   Change thousandths to a fraction with a denominator of 1000.

$$.873 \;=\; 873 \text{ thousandths} \;=\; \frac{873}{1000}$$

Solution:

$$.873 = \frac{|873\,|}{|1000\,|}$$

DPV20

Write this decimal as a mixed number.   Reduce the fraction to lowest terms.

Sample Problem:

$$3.720 = \square\frac{[\ ]}{[\ ]}$$

Hint:

The whole number, left of the decimal, stays the same.   Change the thousandths to a fraction with a denominator of 1000.   Divide the numerator and denominator by the same number to reduce.

$$3.720 = 3 \text{ and } 720 \text{ thousandths} \quad = 3\frac{720}{1000}$$

$$\frac{720}{1000} \cdot \frac{40}{40} \quad \frac{18}{25} = 3\frac{18}{25}$$

Solution:

$$3.720 = 3\frac{[18]}{[25]}$$

Decimals: Addition and Subtraction

DAS01 Add one tenth to a whole number with tenths.   No renaming.   Numbers < 10.   Vertical.
DAS02 Add one tenth to a whole number with tenths.   No renaming.   Numbers < 10.   Horizontal.
DAS03 Subtract one tenth from a whole number with tenths.   No renaming.   Numbers < 10.   Vertical.
DAS04 Subtract one tenth from a whole number with tenths.   No renaming.   Numbers < 10.   Horizontal.
DAS05 Add tenths to a whole number with tenths.   No renaming.   Numbers < 10.   Vertical.
DAS06 Add tenths to a whole number with tenths.   No renaming.   Numbers < 10.   Horizontal.
DAS07 Subtract tenths from a whole number with tenths.   No renaming.   Numbers < 10.   Vertical.
DAS08 Subtract tenths from a whole number with tenths.   No renaming.   Numbers < 10.   Horizontal.
DAS09 Add a whole number to a whole number with tenths. Numbers < 10.   Answers < 20.   Vertical.
DAS10 Add a whole number to a whole number with tenths. Numbers < 10.   Answers < 20.   Horizontal.
DAS11 Subtract a whole number with tenths from a whole number.   Numbers < 10.   Answers < 1.
             Vertical.
DAS12 Subtract a whole number with tenths from a whole number.   Numbers < 10.   Answers < 1.
             Horizontal.
DAS13 Add tenths to a whole number with hundredths.   Number < 100.   Horizontal.
DAS14 Add two numbers with tenths and hundredths.   No renaming.   Numbers < 10.   Vertical.
DAS15 Add two numbers with tenths and hundredths.   No renaming.   Numbers < 10.   Horizontal.
DAS16 Subtract two numbers with tenths and hundredths.   No renaming.   Numbers < 10.   Vertical.
DAS17 Subtract two numbers with tenths and hundredths.   Nor renaming.   Numbers < 10.   Horizontal.
DAS18 Add two numbers with decimals up to hundredths, with some only tenths.   No renaming.   Numbers
             < 10.   Vertical.
DAS19 Subtract two numbers with decimals up to hundredths, with some only tenths.   No renaming.
             Numbers < 10.   Horizontal.
DAS20 Add two numbers with decimals up to hundredths, with some only tenths.   If renaming, one time
             only.   Numbers < 10.   Vertical.
DAS21 Subtract two numbers with decimals up to hundredths, with some only tenths.   If renaming, one
             time only.   Numbers < 10.   Vertical.

DPV21

Rewrite the given number in thousandths.

Sample Problems:

.62 = [ ]   or   .5 = [ ]

Hint:

Thousandths have three digits right of the decimal point.   Add extra zeros to change tenths and hundredths to thousandths.

.62 = .62 0

.5 = .500

Solutions:

.62 = [.620]   or   .5 = [.500]

DPV22

Write the fraction as a decimal rounded to the nearest hundredth.

Sample Problems:

$\frac{1}{5}$ → []   or $\frac{3}{4}$ → []   or $\frac{2}{3}$ → []

Hint:
When the denominator equals **2**, **5**, or **10**, rename the fraction as tenths.   Multiply the numerator and denominator by the same number.

$\frac{1}{5} \cdot \frac{2}{2} = \frac{2}{10} =$ 2 tenths $=$ .2

When the denominator equals **4**, think of how many fourths (or quarters). $\frac{1}{4}$ = .25. Multiply .25 by the number of fourths.

$\frac{1}{4}$ = .25

$\frac{3}{4}$ = .25 ′ 3 = .75

When the denominator equals **3** or **6**, think of how many thirds. $\frac{1}{3}$ = .33.   Multiply .33 by the number of thirds.   Round answer to the nearest hundredth.

$\frac{1}{3}$ = .333

$\frac{2}{3}$ = .333 ′ 2 = .666 = .67

Solutions:

$\frac{1}{5}$ → |.2| or $\frac{3}{4}$ → |.75| or $\frac{2}{3}$ → |.67|

DPV23

Write this fraction as a decimal.

Sample Problem:

$\frac{3}{8}$ []

Hint:
A fraction can be read as a division problem.   Divide the numerator by the denominator.
Divide to the nearest thousandth by adding a decimal and three zeros to the dividend.

$\frac{3}{8}$ = $\frac{[]}{8)\overline{3}}$ = $\frac{[]}{8)\overline{3.000}}$ = $\frac{[.375]}{8)\overline{3.000}}$

Solution:

$\frac{3}{8}$ |.375 |

DPV24

Write this fraction as a decimal.

Sample Problems:

$$\frac{3}{5} = [] \quad \text{or} \quad \frac{7}{20} = []$$

Hint:
Rename the fractions as tenths or hundredths.   When the denominator equals 5, multiply the numerator and denominator by 2 to make tenths.

$$\frac{3}{5} \cdot \frac{2}{2} = \frac{6}{10} = 6 \text{ tenths } = .6$$

When the denominator equals 20, multiply the numerator and denominator by 5 to make hundredths.

$$\frac{7}{20} \cdot \frac{5}{5} = \frac{35}{100} = 35 \text{ hundredths } = .35$$

Solutions:

$$\frac{3}{5} = |.6| \quad \text{or} \quad \frac{7}{20} = |.35|$$

DDV02

Do this division.

Sample Problem:

```
        []
    ───────
  5) 2.55
```

Hint:
When the divisor is a whole number, divide the numbers without the decimal.   Then place the decimal in the answer directly above the decimal in the dividend.

```
      51              . 51
   ────────       ──────────
  5) 255          5) 2 . 55
```

Solution:

```
     |.51|
   ────────
  5) 2.55
```

DAS04

Do this subtraction.

Sample Problem:

9.8 - .1 = []

Hint:
Subtract 1 from the tenths.   The tenths are directly to the right of the decimal point.
The whole number stays the same.

9.8 - .1 = 9 . 7

Solution:

9.8 - .1 = |9.7|

DAS05

Add these numbers.

Sample Problem:

```
    6.4
+    .5
───────
    []
```

Hint:
Add the tenths.   The tenths are directly to the right of the decimal point.   The whole number stays the same.

```
  6 . 4
+   . 5
──────────
  6 . 9
```

Solution:

```
    6.4
+    .5
───────
  [6.9]
```

DAS06

Add these numbers.

Sample Problem:

6.4 + .5 = []

Hint:
Add the tenths.   The tenths are directly to the right of the decimal point.   The whole number stays the same.

6.4 + .5 = 6.9

Solution:

6.4 + .5 = |6.9|

DAS07

Do this subtraction.

Sample Problem:

```
  8.7
-  .2
─────
  []
```

Hint:
Subtract the tenths.   The tenths are directly to the right of the decimal point.   The whole number stays the same.

```
  8 . 7
-   . 2
───────
  8 . 5
```

Solution:

```
  8.7
-  .2
─────
 [8.5]
```

DAS08

Do this subtraction.

Sample Problem:

8.7 - .2 = []

Hint:
Subtract the tenths.   The tenths are directly to the right of the decimal point.   The whole number stays the same.

8.7 - .2 = 8 . 5

Solution:

8.7 - .2 = |8.5|

DAS09

Add these numbers.

Sample Problem:

```
    6.3
+   9
  ─────
   []
```

Hint:
Add the whole numbers.   The tenth stays the same.   Put the decimal point between the whole number and the tenth.

```
   6 . 3
+     9
  ───────
  15 . 3
```

Solution:

```
    6.3
+   9
  ─────
  [15.3]
```

DAS10

Add these numbers.

Sample Problem:

6.3 + 9 = []

Hint:

Add the whole numbers.   The tenth stays the same.   Put the decimal point between the whole number and the tenth.

6.3 + 9 = 15 . 3

Solution:

6.3 + 9 = |15.3|

Do this subtraction.

Sample Problem:

```
    9
-   8.6
  ─────
   []
```

Hint:

The whole number equals a decimal number with 0 tenths.   Subtract the numbers and place the decimal to the left of the tenths.

```
                 9 . 0
9  -  9.0      -  8 . 6
   ─────        ───────
                   . 4
```

Solution:

```
    9
-   8.6
  ─────
  [.4]
```

DML01

Use the arrow keys to show where the decimal point belongs.

Sample Problem:

```
    0.37
.         1.9
  .0.7.0.3.
```

Hint:
First, count the total number of digits to the right of the decimal point in both of the factors.

0 . 37 has **2** digits right of the decimal.

1 . 9 has **1** digit right of the decimal.

2 + 1 = 3 A total of **3** digits right of the decimal.

Multiply the factors without the decimals.   Then place the decimal point in the product so there are the same number of digits to the right of the decimal as there were in the two factors combined.

```
      ⁶
    0 3 7
.      19
    333      0 . 703 has  3  digits right of the decimal      .
+   037 0
    0703
```

Solution:

```
    0. 37
.        1.9
  .0 . 7.0 .3.
```

DAS12

Do this subtraction.

Sample Problem:

9 - 8.6 = []

Hint:

The whole number equals a decimal number with 0 tenths.   Subtract the numbers and place the decimal to the left of the tenths.

9 = 9.0   9.0 - 8.6 =   .4

Solution:

9 - 8.6 = |.4|

DAS13

Add these numbers.

Sample Problem:

64.02 + .8 = []

Hint:
Add the tenths.   The tenths are directly to the right of the decimal point.   The other numbers stay the same.

64.02 + .8 = 64 . 82

Solution:

64.02 + .8 = |64.82 |

DAS14

Add these numbers.

Sample Problem:

```
   6.22
+  1.65
  ──────
    []
```

Hint:
Add from right to left.   First, add the hundredths.   Then add the tenths and the whole numbers.   Place the decimal between the whole number and the tenths.

```
  6 .2  2          6 .  2 2
+ 1 .6  5      +   1 .  6 5
 ───────          ─────────
  _.  _7           7 .  8 7
```

Solution:

```
   6.22
+  1.65
  ──────
  |7.87|
```

DAS15

Add these numbers.

Sample Problem:

6.22 + 1.65 = []

Hint:

Add from right to left.   First, add the hundredths.   Then add the tenths and the whole numbers.   Place the decimal between the whole number and the tenths.

6.22 + 1.65 = _ . _ 7
6.22 + 1.65 = _ .87
6.22 + 1.65 = 7 . 87

Solution:

6.22 + 1.65 = |7.87|

DAS16

Do this subtraction.

Sample Problem:

```
   9.73
-  4.61
   []
```

Hint:
Subtract from right to left.   First, subtract the hundredths.   Then subtract the tenths
and the whole numbers.   Place the decimal between the whole number and the tenths.

```
  9 .7 3        9 . 7 3
- 4 .6 1      - 4 . 6 1
    _. _2        5 . 1 2
```

Solution:

```
   9.73
-  4.61
  [5.12]
```

Decimals: Multiplication

DML01 Show where the decimal point goes in the product.   Product of a whole number with tenths or hundredths. Numbers < 10.   Answers up to thousandths.   Use arrows to highlight correct decimal point.

DML02 Multiply tenths by a single digit whole number.   Vertical.

DML03 Multiply tenths by a single digit whole number.   Horizontal.

DML04 Multiply hundredths by a single digit whole number.   Tenths = 0.   Vertical.

DML05 Multiply hundredths by a single digit whole number.   Tenths = 0.   Horizontal.

DML06 Multiply thousandths by a single digit whole number.   Tenths and hundredths = 0.   Vertical.

DML07 Multiply thousandths by a single digit whole number.   Tenths and hundredths = 0.   Horizontal.

DML08 Multiply tenths by tenths.   Vertical.

DML09 Multiply tenths by tenths.   Horizontal.

DML10 Multiply hundredths where tenths = 0 by tenths.   Vertical.

DML11 Multiply hundredths where tenths = 0 by tenths.   Horizontal.

DML12 Multiply a number with a decimal up to thousandths by 10, 100 or 1000.   Numbers < 100.   Horizontal.

DML13 Multiply a number with a decimal up to thousandths by 0.1, 0.01 or 0.001.

DML14 Multiply a number with a decimal up to thousandths by .1, .01, .001, 10, 100 or 1000.

DML15 Multiply hundredths where hundredth place = 0 , 5 by a whole number < 5.   Vertical.

DML16 Multiply a decimal up to thousandths by a whole number < 5.   Thousandths place = 0 , 5.   Vertical.

DAS17

Do this subtraction.

Sample Problem:

9.73 - 4.61 = []

Hint:
Subtract from right to left.   First, subtract the hundredths.   Then subtract the tenths and the whole numbers.   Place the decimal between the whole number and the tenths.

9.73 - 4.61 = _._2
9.73 - 4.61 = _.12
9.73 - 4.61 = 5.12

Solution:

9.73 - 4.61 = |5.12|

DAS18

Add these numbers.

Sample Problem:

5.8 + 5.16 = []

Hint:
If one number has only tenths, rename it as a decimal number with 0 hundredths.   Add from right to left.   First, add the hundredths.   Then add the tenths and the whole numbers.   Place the decimal between the whole number and the tenths.

5.8 = 5.80

5.80 + 5.19 = _._ 9

5.80 + 5.19 = _.99

5.8 + 5.19 = 10 . 99

Solution:

5.8 + 5.16 = |10.99|

DAS19

Do this subtraction.

Sample Problem:

6.74 - 2.1 = []

Hint:

If one number has only tenths, rename it as a decimal number with 0 hundredths. Subtract from right to left.   First, subtract the hundredths.   Then subtract the tenths and the whole numbers.   Place the decimal between the whole number and the tenths.

2.1 = 2.10

6.74 - 2.10 = _._ 4

6.74 - 2.10 = _.64

6.74 - 2.10 = 4 . 64

Solution:

6.74 - 2.1 = |4.64 |

DAS20

Add these numbers.

Sample Problem:

```
    8.2
+   1.93
    []
```

Hint:

If one number has only tenths, rename it as a decimal number with 0 hundredths.

8.2 = 8.20

Add from right to left.   First, add the hundredths.   Then add the tenths and the whole numbers.   Place the decimal between the whole number and the tenths.

```
 1               1
  8 .2 0          8 . 2 0
+ 1 .9 3       +  1 . 9 3
    .1 3        1 0 . 1 3
```

Solution:

```
    8.2
+   1.93
  [10.13]
```

DAS21

Do this subtraction.

Sample Problem:

```
    9.6
-   3.34
────────
    []
```

Hint:
If one number has only tenths, rename it as a decimal number with 0 hundredths.
9.6 = 9.60

Subtract from right to left, renaming if necessary.   First, subtract the hundredths.   Then subtract the tenths and then the whole numbers.   Place the decimal between the whole number and the tenths.

```
        5 10                    5 10
    9 . 6 0             9 . 6 0
-   3 . 3 4         -   3 . 3 4
──────────          ──────────
      . 2 6             6 . 2 6
```

Solution:

```
    9.6
-   3.34
────────
   |6.36|
```

DML03

Multiply these numbers.

Sample Problem:

0.5 · 9 = []

Hint:

Multiply the factors without the zero.   The zero is a place holder for the decimal.   When 1 factor is a tenth and the other is a whole number, the factors have a total of 1 digit right of the decimal point.   The product will also have 1 digit right of the decimal point.

0.5 · 9 = 45   =   4 . 5

Solution:

0.5 · 9 = |4.5|

DML04

Multiply these numbers.

Sample Problem:

```
  .08
.    5
─────────
   []
```

Hint:
Multiply the factors without the zero.   The zero is a place holder for the decimal.   When 1 factor is a hundredth and the other is a whole number, the factors have a total of 2 digits right of the decimal point.   The product will also have 2 digits right of the decimal point.

```
  .08
.    5    =   . 40
─────────
   40
```

Solution:

```
  .08
.    5
─────────
 [.40]
```

DML05

Multiply these numbers.

Sample Problem:

.08 · 5 = []

Hint:

Multiply the factors without the zero.   The zero is a place holder for the decimal.   When 1 factor is a hundredth and the other is a whole number, the factors have a total of 2 digits right of the decimal point.   The product will also have 2 digits right of the decimal point.

.08 · 5 = 40   =   . 40

Solution:

.08 · 5 = |.40|

DML06

Multiply these numbers.

Sample Problem:

```
  .004
·     3
_____
   []
```

Hint:
Multiply the factors without the zero.   The zero is a place holder for the decimal.   When 1 factor is a thousandth and the other is a whole number, the factors have a total of 3 digits right of the decimal point.   The product will also have 3 digits right of the decimal point.

```
  .00 4
·     3   =  . 012
_____
   12
```

Solution:

```
  .004
·     3
_____
 [.012 ]
```

DML07

Multiply these numbers.

Sample Problem:

.004 ˙ 3 = [ ]

Hint:
Multiply the factors without the zero.   The zero is a place holder for the decimal.   When 1 factor is a thousandth and the other is a whole number, the factors have a total of 3 digits right of the decimal point.   The product will also have 3 digits right of the decimal point.

.004 ˙ 3 = 12   =   .012

Solution:

.004 ˙ 3 = |.012 |

DML08

Multiply these numbers.

Sample Problem:

```
   0.7
·  0.6
  ____
   []
```

Hint:
Multiply the factors without the zero.   The zero is a place holder for the decimal.   When both factors are tenths, the factors have a total of 2 digits right of the decimal point. The product will also have 2 digits right of the decimal point.

```
   0.7
·  0.6   =   . 42
  ____
   42
```

Solution:

```
   0.7
·  0.6
  ____
 [.42]
```

DML09

Multiply these numbers.

Sample Problem:

0.7 ˙ 0.6 = []

Hint:
Multiply the factors without the zero.   The zero is a place holder for the decimal.   When both factors are tenths, the factors have a total of 2 digits right of the decimal point. The product will also have 2 digits right of the decimal point.

0.7 ˙ 0.6 = 42   =   . 42

Solution:

0.7 ˙ 0.6 = |.42|

DDV01

Do this division.

Sample Problem:

```
    []
7)2.8
```

Hint:
 When the divisor is a whole number, divide the numbers without the decimal.   Then place the decimal in the answer directly above the decimal in the dividend.

```
    4         . 4
7)28      7)2 . 8
```

Solution:

```
   |.4|
7) 2.8
```

DML10

Multiply these numbers.

Sample Problem:

```
   .06
 ˙  0.9
  ─────
    []
```

Hint:
Multiply the factors without the zero.   The zero is a place holder for the decimal.   When 1 factor is a hundredth and the other is a tenth, the factors have a total of 3 digits right of the decimal point.   The product will also have 3 digits right of the decimal point.

```
   .06
 ˙  0.9    =   . 054
  ─────
    54
```

Solution:

```
    .06
 ˙   0.9
   ─────
   [. 054 ]
```

DML11

Multiply these numbers.

Sample Problem:

.06 ˙ 0.9 = []

Hint:

Multiply the factors without the zero.   The zero is a place holder for the decimal.   When 1 factor is a hundredth and the other is a tenth, the factors have a total of 3 digits right of the decimal point.   The product will also have 3 digits right of the decimal point.

.06 ˙ 0.9 = **54**   =   . 054

Solution:

.06 ˙ 0.9 = |.054 |

DML12

Multiply these numbers.

Sample Problems:

10 ⋅ 26.78 = []   or   1000 ⋅ 3.295 = []

Hint:

Multiplying by 10, 100 or 1000 doesn't change the numbers, it only changes the decimal place. Move the decimal point to the right the same number of digits as there are zeros in the factor. Add zeros, as needed, to hold the decimal place.

10 has **1** zero.

10 ⋅ 26.78 = 26.7.8 = 267.8

or

1000 has **3** zeros

1000 ⋅ 3.295 = 3.2 9 5. = 3295

Solutions:

10 ⋅ 26.78 = |267.8| or   1000 ⋅ 3.295 = |3295|

Decimals: Division

DDV01 Divide a number < 10 with tenths by a one digit whole number.   No renaming.
DDV02 Divide a number < 10 with hundredths by a one digit whole number.   No renaming.   Each digit divides evenly
DDV03 Divide a number < 1 in hundredths by a one digit whole number.
DDV04 Divide a number < 10 with tenths by tenths.   Each digit goes evenly.
DDV05 Divide tenths into a one digit whole number.   No remainder.
DDV06 Divide hundredths where tenth = 0 into hundredths.   Divides evenly.
DDV07 Divide hundredths where tenth = 0 into number < 10.   Number divides in evenly.
DDV08 Divide hundredth where tenth = 0 into one digit whole number.   No remainder.
DDV09 Divide hundredth where tenth = 0 into a whole number < 100.   Number divides in evenly.
DDV10 Divide a number < 1 with thousandths by thousandths.   Hundredth and tenth = 0 in divisor.   Each digit divides evenly.
DDV11 Divide a number < 1 with hundredths by thousandths.   Hundredth and tenth = 0 in divisor.   Each digit divides evenly.
DDV12 Divide a number < 100 with tenths by thousandths.   Hundredth and tenth = 0 in divisor.   Each digit divides evenly.
DDV13 Divide a whole number < 10 by thousandths.   Hundredth and tenth = 0 in divisor.   Divides evenly.
DDV14 Divide a whole number < 100 by thousandth.   Hundredth and tenth = 0 in divisor.   Divides evenly.
DDV15 Divide a whole number < 1000 by thousandths.   Hundredth and tenth = 0 in divisor.   Each digit divides evenly.
DDV16 Divide a number by 10, 100, or 1000.   Numbers < 100 with decimals up to hundredths.
DDV17 Divide a number by .1, .01, .001.   Number < 100 with decimals up to hundredths.
DDV18 Divide a number by .1, .01, .001, 10, 100, or 1000.   Numbers < 100 with decimals up to hundredths.

DML13

Multiply these numbers.

Sample Problems:

.01 ˙ 88.23 = [ ]   or   .001 ˙ 96 = [ ]

Hint:
Multiplying by .1, .01 or .001 doesn't change the numbers, it only changes the decimal place.   Move the decimal point to the left the same number of digits as there are digits right of the decimal in the factor.   Add zeros, as needed to hold the decimal place.

.01   has **2** digits right of the decimal   .
.01 ˙ 88.23   =   .8 8.23   =   . 8823

or

.001   has **3** digits right of the decimal   .
.001 ˙ 96   =   .0 9 6.   =   . 096

Solutions:

.01 ˙ 88.23 = |.8823 | or   .001 ˙ 96 = |.096 |

DML14

Multiply these numbers.

Sample Problems:

100 · .692 = []   or   .1 · 53.1 = []

Hint:
Multiplying by .1, .01, .001, 10, 100 or 1000 doesn't change the numbers, it only changes the decimal place. When the factor is less than 1, move the decimal point to the left the same number of digits as there are digits right of the decimal in the factor. Add zeros, as needed to hold the decimal place.

.1 has 1 digit right of the decimal   .

.1 · 53.1 = 5.3.1 = 5.31

If the factor is greater than 1, move the decimal point to the right the same number of digits as there are zeros in the factor. Add zeros, as needed, to hold the decimal place.

100 has 2 zeros .

100 · .692 = .6 9.2 = 69.2

Solutions:

100 · .692 = |69.2| or   .1 · 53.1 = |5.31|

DML15

Multiply these numbers.

Sample Problem:

```
   .45
·    3
───────
    []
```

Hint:
Multiply the factors without the decimals.   When 1 factor is a hundredth and the other is a whole number, the factors have a total of 2 digits right of the decimal point.   The product will also have 2 digits right of the decimal point.

```
    ¹
   4 5
·    3    1 .35 has  2 digits right of the decimal     .
───────
   135
```

Solution:

```
   .45
·    3
───────
 [1.35]
```

DML16

Multiply these numbers.

Sample Problem:

```
  .115
.     4
_____
     []
```

Hint:
Multiply the factors without the decimals.   When 1 factor is a thousandth and the other is a whole number, the factors have a total of 3 digits right of the decimal point.   The product will also have 3 digits right of the decimal point.

```
   2
 115
.    4      .460  has  3 digits right of the decimal      .
_____
 460
```

Solution:

```
  .115
.     4
_____
 [.460 ]
```

DDV03

Do this division.

Sample Problem:

$$\frac{[\,]}{4\,).24}$$

Hint:
When the divisor is a whole number, divide the numbers without the decimal.   Then place the decimal in the answer directly above the decimal in the dividend.   Use a zero to hold the decimal place.

$$\frac{6}{4\,)\,24} \qquad \frac{.\,06}{4\,)\,.\,24}$$

Solution:

$$\frac{[.06\,[}{4\,).24}$$

DDV04

Do this division.

Sample Problem:

$$
.3\overline{)6.9}
$$

Hint:

When dividing by tenths, move the decimal point one digit to the right in both the divisor and the dividend.   Then divide.

$$
.3\overline{)6.9} \quad = \quad .3.\overline{)6.9.} \quad = \quad 3\overline{)69}^{23}
$$

Solution:

$$
.3\overline{)6.9}^{|23|}
$$

PCT02

Change the percent to a decimal or the decimal to a percent.

Sample Problems:

25 % = []   or   .45 = []%

Hint:

The percent equals the number of hundredths.   Hundredths have two digits to the right of the decimal point.

25% = 25 hundredths = .25

.45 = 45 hundredths = 45 %

Solutions:

25% = |.25| or   .45 = |45|%

DDV05

Do this division.

Sample Problem:

$$\frac{[\,]}{.4\,)\,8}$$

Hint:
When dividing by tenths, move the decimal point one digit to the right in both the divisor and the dividend.   Add a zero to hold the decimal point.   Then divide.

$$\frac{[\,]}{.4\,)\,8} \quad = \quad \frac{[\,]}{.4.\,)\,8.0.} \quad = \quad \frac{20}{4\,)\,80}$$

Solution:

$$\frac{|\,20\,|}{.4\,)\,8}$$

DDV06

Do this division.

Sample Problem:

$$.07 \overline{)\ .49}$$

Hint:
When dividing by hundredths, move the decimal point two digits to the right in both the divisor and the dividend.   Then divide.

$$.07 \overline{)\ .49} \quad = \quad .0\ 7. \overline{)\ .4\ 9.} \quad = \quad 7 \overline{)\ 49}$$

Solution:

$$.07 \overline{)\ .49} \quad |7|$$

DDV07

Do this division.

Sample Problem:

$$\frac{[]}{.05^{)}\,4.5}$$

Hint:
When dividing by hundredths, move the decimal point two digits to the right in both the divisor and the dividend.   Add a zero to hold the decimal point.   Then divide.

$$\frac{[]}{.05^{)}\,4.5} \quad = \quad \frac{[]}{.0\,5.^{)}\,4.5\,0.} \quad = \quad \frac{90}{5^{)}\,450}$$

Solution:

$$\frac{|90\,|}{.05^{)}\,4.5}$$

DDV08

Do this division.

Sample Problem:

$$\frac{[\,]}{.02\,^{)}\,6}$$

Hint:
When dividing by hundredths, move the decimal point two digits to the right in both the divisor and the dividend.   Add zeros to hold the decimal point.   Then divide.

$$\frac{[\,]}{.02\,^{)}\,6} \quad = \quad \frac{[\,]}{.0\,2.\,^{)}\,6.\,0\,0.} \quad = \quad \frac{300}{2\,^{)}\,600}$$

Solution:

$$\frac{|\,300\,|}{.02\,^{)}\,6}$$

DDV09

Do this division.

Sample Problem:

$$\frac{[]}{.05 \overline{)\ 45}}$$

Hint:
When dividing by hundredths, move the decimal point two digits to the right in both the divisor and the dividend.   Add zeros to hold the decimal point.   Then divide.

$$\frac{[]}{.05 \overline{)\ 45}} \quad = \quad \frac{[]}{.0\ 5.\overline{)\ 45.0\ 0.}} \quad = \quad \frac{900}{5 \overline{)\ 4500}}$$

Solution:

$$\frac{|\ 900\ |}{.05 \overline{)\ 45}}$$

DDV10

Do this division.

Sample Problem:

```
          []
.002 ).882
```

Hint:
When dividing by thousandths, move the decimal point three digits to the right in both the divisor and the dividend.   Then divide.

```
          []                    []              441
.002 ).882     =     .0 0 2.).8 8 2.     =     2)882
                      * * *    * * *
```

Solution:

```
        |441 |
.002 ). 882
```

DDV11

Do this division.

Sample Problem:

```
        []
.002 ) 8.06
```

Hint:
When dividing by thousandths, move the decimal point three digits to the right in both the divisor and the dividend.   Add zeros to hold the decimal point.   Then divide.

```
        []                    []            4030
.002 ) 8.06    =    .0 0 2.)8. 0 6 0.   =   2) 8060
                      * * *     * * *
```

Solution:

```
        |4030 |
.002 ) 8.06
```

DDV12

Do this division.

Sample Problem:

```
            []
  _____
.003 )63 .9
```

Hint:

When dividing by thousandths, move the decimal point three digits to the right in both the divisor and the dividend.   Add zeros to hold the decimal point.   Then divide.

```
            []                    []              21300
  _____            _____          _____
.003 )63 .9    =    .0 0 3.)63.9 0 0.    =    3)63900
                    ***          ***
```

Solution:

```
         |21300 |
  _____
.003 )63 .9
```

PCT01

Write this ratio as a percent.

Sample Problem:

3 to 100 = []%

Hint:
The percent equals the number out of 100.

3 to 100 = 3%

Solution:

3 to 100 = |3|%

DDV13

Do this division.

Sample Problem:

$$\frac{[\,]}{.004\,\overline{)\,8}}$$

Hint:
When dividing by thousandths, move the decimal point three digits to the right in both the divisor and the dividend.   Add zeros to hold the decimal point.   Then divide.

$$\frac{[\,]}{.004\,\overline{)\,8}} \;=\; \frac{[\,]}{.004.\,\overline{)\,8.000.}} \;=\; \frac{2000}{4\,\overline{)\,8000}}$$

Solution:

$$\frac{|2000\,|}{.004\,\overline{)\,8}}$$

DDV14

Do this division.

Sample Problem:

$$\frac{[]}{.005 \overline{)52}}$$

Hint:
When dividing by thousandths, move the decimal point three digits to the right in both the divisor and the dividend.   Add zeros to hold the decimal point.   Then divide.

$$\frac{[]}{.005 \overline{)52}} \quad = \quad \frac{[]}{.005. \overline{)52.000.}} \quad = \quad \frac{10400}{5 \overline{)52000}}$$

Solution:

$$\frac{|10400|}{.005 \overline{)52}}$$

DDV15

Do this division.

Sample Problem:

$$.003 \overline{)966}$$

Hint:

When dividing by thousandths, move the decimal point three digits to the right in both the divisor and the dividend.   Add zeros to hold the decimal point.   Then divide.

$$.003 \overline{).882} \quad = \quad .003.\overline{)966.000.} \quad = \quad 3 \overline{)966000} \quad 322000$$

Solution:

$$.003 \overline{)966} \quad |322000|$$

Percents

PCT01 Convert a written expression to a percent.   Numbers £ 100.
PCT02 Convert a decimal to a percent and vice versa.   Numbers .01 .. 1.00.
PCT03 Convert a fraction with denominator 100 to a percent and vice versa.   Numbers £ 100.
Denominators = 100.
PCT04 Write a whole number as a percent.   Numbers 0..10.
PCT05 Convert a fraction to a percent.   Numbers in thousandths or denominator = 100 then numerator is
between 101 and 999.
PCT06 Compare fractions, decimals, and percents.   Numbers are multiples of 5.
PCT07 Show equivalent fractions, decimals and percents.   Denominator = 100.   Show all three, fill in one
        missing.   Numbers to 100.
PCT08 Reduce a fraction with denominator 100 to lowest form.   X = 10, 20, 25, 33 1/3, 50, 66 2/3, 75.
PCT09 Convert a common fraction to a percent.   Round to the nearest percent.
PCT10 Convert tenths to a percent.   x = 0..10. n=10x.
PCT11 Convert fifths to a percent.   x = 0..5.   n = 20x.
PCT12 Convert percent into lowest term fraction.   Variable x is a multiple of 5 or 20.
PCT13 Find 10% of a whole number.   W = multiples of 10: 10 .. 500.
PCT14 Find 1% of a whole number.   W = whole numbers: 1 .. 500.
PCT15 Find the percent of a whole number.   X = 10, 25, 50, 75, 100.   n = whole number: 1 .. 20.

DDV16

Do this division.

Sample Problems:

34.5 ，10 = []   or   1.88 ，1000 = []

Hint:
Dividing by 10, 100 or 1000 doesn't change the numbers, it only changes the decimal place.   Move the decimal point to the left the same number of digits as there are zeros in the factor.   Add zeros, as needed, to hold the decimal place.

10 has **1** zero .

34.5 ，10   =   3.4.5   =   3 . 45

or

1000 has **3** zeros

1.88 ，1000   =   .0 0 1.88   =   . 00188

Solutions:

34.5 ，10 = |3.45| or   1.88 ，1000 = |.00188 |

Do this division.

Sample Problems:

5.62 , .01 = [ ]   or   8.95 , .001 = [ ]

Hint:
Dividing by .1, .01 or .001 doesn't change the numbers, it only changes the decimal place.   Move the decimal point to the right the same number of digits as there are digits right of the decimal in the factor.   Add zeros, as needed to hold the decimal place.

.01   has 2 digits right of the decimal   .

5.62 , .01   =   5.6 2.   =   562 .

or

.001   has 3 digits right of the decimal   .

8.95 , .001   =   8.9 5 0.   =   8950 .

Solutions:

5.62 , .01 = |562| or   8.95 , .001 = |8950|

DDV18

Do this division.

Sample Problems:

9.04 , .1 = []   or   16.7 , 100 = []

Hint:
Dividing by .1, .01, .001, 10, 100 or 1000 doesn't change the numbers, it only changes the decimal place.   When the factor is less than 1, move the decimal point to the right the same number of digits as there are digits right of the decimal in the factor.   Add zeros, as needed to hold the decimal place.

.1 has 1 digit right of the decimal   .

9.04 , .1 = 9.0.4 = 90 . 4

If the factor is greater than 1, move the decimal point to the left the same number of digits as there are zeros in the factor.   Add zeros, as needed, to hold the decimal place.

100 has **2** zeros .

16.7 , 100 = .1 6.7 =   . 167

Solutions:

9.04 , .1 = |90.4| or   16.7 , 100 = |.167 |

PCT03

Change the fraction to a percent or the percent to a fraction.

Sample Problems:

$$\frac{[]}{100} = 17\%\quad \text{or}\quad \frac{65}{100} = []\%$$

Hint:
The percent equals the number of hundredths, so the percent equals the numerator of a fraction when the denominator is 100.

$$17\% = 17 \text{ hundredths} = \frac{17}{100}$$

$$\frac{65}{100} = 65 \text{ hundredths} = 65\%$$

Solutions:

$$\frac{|17|}{100} = 17\%\quad \text{or}\quad \frac{65}{100} = |65|\%$$

PCT04

Write this whole number as a percent.

Sample Problems:

1 = []%   or   6 = []%

Hint:
Multiply a whole number by 100 to express it as a percent.

1 · 100 = 100   =   100%
6 · 100 = 600   =   600%

Solutions:

1 = |100 |%   or   6 = |600 |%

PCT05

Change this fraction to a percent.

Sample Problems:

$$\frac{212}{100} = \boxed{}\% \quad \text{or} \quad \frac{37}{1000} = \boxed{}\%$$

Hint:
The percent equals the number of hundredths, so the percent equals the numerator of a fration when the denominator equals 100.

$$\frac{212}{100} = 212 \text{ hundredths} = 212\%$$

When the denominator equals 1000, convert the fration to hundredths by dividing the numerator and denominator by 10.

$$\frac{37}{1000} \cdot \frac{10}{10} = \frac{3.7}{100}$$

$$\frac{3.7}{100} = 3.7 \text{ hundredths} = 3.7\%$$

Solutions:

$$\frac{212}{100} = \boxed{212}\% \quad \text{or} \quad \frac{37}{1000} = \boxed{3.7}\%$$

PCT06

Use <,>,or = to compare these numbers.

Sample Problems:

.25 [] 30%   or   .20 [] $\dfrac{20}{100}$

Hint:
The percent equals the number of hundredths.   Compare the number of hundredths.

.25 = **25** hundredths

30% = **30** hundredths   **25 < 30**

or

.20 = **20** hundredths

$\dfrac{20}{100}$ = **20** hundredths   **20 = 20**

Solutions:

.25 |<| 30%   or   .20 |=| $\dfrac{20}{100}$

PCT07

Fill in the missing numbers.

Sample Problem:

$$\frac{45}{100} = [\ ]\% = .45$$

Hint:
The percent equals the number of hundredths.

$$\frac{45}{100} = .45 = 45 \text{ hundredths} = 45\%$$

Solution:

$$\frac{45}{100} = [45]\% = .45$$

PCT08

Rewrite this fraction in its simplest form.

Sample Problems:

$$\frac{75}{100}\frac{[]}{[]} \text{ or } \frac{33\frac{1}{3}}{100}\frac{[]}{[]}$$

Hint:

Reduce the fraction to lowest terms by dividing the numerator and denominator by the same number.   Use the largest number you can.

$$\frac{75}{100}\frac{25}{25}\frac{3}{4}$$

When the denominator equals $33\frac{1}{3}$ or
$66\frac{2}{3}$, divide the numerator and denominator by
$33\frac{1}{3}$.   The new denominator will equal 3.   The numerator will equal 1 or 2.

$$\frac{33\frac{1}{3}}{100}\frac{33\frac{1}{3}}{33\frac{1}{3}}\frac{1}{3}$$

Solutions:

$$\frac{75}{100}\frac{|3|}{|4|} \text{ or } \frac{33\frac{1}{3}}{100}\frac{|1|}{|3|}$$

PCT09

Change this fraction to a percent.   Round your answer to the nearest whole percent.

Sample Problems:

$$\frac{1}{4} \rightarrow [\ ]\% \quad \text{or} \quad \frac{2}{3} \rightarrow [\ ]\%$$

Hint:
The percent equals the number of hundredths, so the percent equals the numerator of a fration when the denominator equals 100.   Convert the fration to hundredths by multiplying the numerator and denominator by the same number.

$$\frac{1}{4} \cdot \frac{25}{25} = \frac{25}{100} \rightarrow 25 \text{ hundredths} \quad = \quad 25\%$$

When the denominator equals 3, multiply the numerator and denominator by $33\frac{1}{3}$.
Round to the nearest percent.

$$\frac{2}{3} \cdot \frac{33\frac{1}{3}}{33\frac{1}{3}} = \frac{66\frac{2}{3}}{100} \rightarrow 66\frac{2}{3} \text{ hundredths} \quad = \quad 67\%$$

Solutions:

$$\frac{1}{4} \rightarrow \boxed{25}\% \quad \text{or} \quad \frac{2}{3} \rightarrow \boxed{67}\%$$

PCT10

Change this fraction to a percent.

Sample Problem:

$\frac{3}{10} \rightarrow []\%$

Hint:
When the denominator equals 10, convert the fration to hundredths by multiplying the numerator and denominator by 10.

$$\frac{3}{10} \cdot \frac{10}{10} = \frac{30}{100}$$

$$\frac{30}{100} = 30 \text{ hundredths} = 30\%$$

Solution:

$\frac{3}{10} \rightarrow |30|\%$

PCT11

Change this fraction to a percent.

Sample Problem:

$$\frac{2}{5} \rightarrow []\%$$

Hint:

When the denominator equals 5, convert the fration to hundredths by multipying the numerator and denominator by 20.

$$\frac{2}{5} \cdot \frac{20}{20} \quad \frac{40}{100}$$

$$\frac{40}{100} = 40 \text{ hundredths} = 40\%$$

Solution:

$$\frac{2}{5} \rightarrow |40|\%$$

PCT12

Change this percent to a fraction reduced to lowest terms.

Sample Problem:

$$15\% = \frac{[\,]}{[\,]}$$

Hint:
Rename the percent as a fraction with a denominator of 100.   Reduce this fraction to lowest terms by dividing the numerator and denominator by the same number (5 or 20).

$$15\% = \frac{15}{100} = \frac{15}{100} \cdot \frac{5}{5} = \frac{3}{20}$$

Solution:

$$15\% = \frac{[3]}{[20]}$$

PCT13

Find 10% of the given number.

Sample Problem:

10% of 360 = []

Hint:
10% of any number equals that number divided by 10..

360 , 10 = 36

Solution:

10% of 360 = |36|

PCT14

Find 1% of the given number.

Sample Problem:

1% of 495 = []

Hint:

1% of any number equals that number divided by 100.   Express answers in decimal form by moving the decimal two places to the left.

495 = 495.

495. , 100 = 4.9 5. = 4.95

Solution:

1% of 495 = |4.95|

PCT15

Multiply to find the given percent.

Sample Problem:

75% of 20 = []

Hint:

100% of any number equals **that number**.

10% of any number equals that number **times** $\frac{1}{10}$.

25% of any number equals that number **times** $\frac{1}{4}$.

50% of any number equals that number **times** $\frac{1}{2}$.

75% of any number equals that number **times** $\frac{3}{4}$.

75% of 20 = 20 · $\frac{3}{4}$ = 5 · 3 = 15

Solution:

75% of 20 = |15|

Review   *Fractions: Division*

Mixed practice adding, subtracting, multiplying and dividing fractions and mixed numbers.

FAS30 **Add two fractions < 1.   One fraction is easily reduced.   Sum < 1.   Horizontal.**
FAS32 **Add two fractions < 1.   One fraction is easily reduced.   Sum > 1.   Horizontal.**
FAS34 **Add two mixed numbers.   One fraction is easily reduced. No renaming or reducing required.**
         Horizontal.
FAS38 **Subtract two mixed numbers.   One fraction is easily reduced. No renaming or reducing required.**
         Horizontal.
FAS40 **Subtract two mixed numbers.   One fraction is easily reduced.   Renaming and reducing required.**
         Horizontal.
FML06 **Multiply two lowest terms fractions < 1.   Reducing required.   Fractions can be easily simplified**
         before multiplication.
FML08 **Multiply two mixed numbers.   Reducing required.**
FDV07 **Divide a mixed number by a fraction.   Reducing required.**
FDV08 **Divide a fraction by a mixed number.   Reducing required.**
FDV09 **Divide two mixed numbers.   Reducing required.**

Review   *Fractions: Equivalents*

Use both multiplication and division to make equivalent fractions.

FEQ02 **Identify the multiplier in making an equivalent fraction < 1.**
FEQ04 **Identify the divisor in making an equivalent fraction < 1.**

Review   *Fractions: Equivalent*

Rename whole numbers to improper fractions and mixed numbers.

FEQ06   **Idendify whole number values of fractions.**
FEQ07   **Write whole number as a mixed number, or vice versa.**

Review   *Fractions: Lowest Terms*

Use both multiplication and division to make equivalent fractions.

FEQ02 **Identify the multiplier in making an equivalent fraction < 1.**
FEQ04 **Identify the divisor in making an equivalent fraction < 1.**

Review   *Fractions: Lowest Terms*

Find common denominators for numbers that are relativelty prime, multiples of one another, or share a single factor.

FLT06   **Name a common denominator of two lowest terms fractions < 1.   Denominators are relatively prime.**
FLT07   **Name a common denominator of two lowest term fractions < 1.   One denominator is a multiple of the other.**
FLT08   **Name a common denominator of two lowest term fractions < 1.   Denominators share one factor.**

Review *Fractions: Comparing*

Compare two fractions whose denominators may

FCM01 **Compare two fractions < 1 with common denominators.**
FCM02 **Compare two fractions < 1 with differentdenominators.**

Review   *Fractions: Comparing*

Compare fractions and mixed numbers -- renaming not required.

FCM01 **Comapre two fractions < 1 with a common denominators.**
FCM02 **Compare two fractions < 1 with different denominators.**
FCM03 **Compare two proper mixed numbers with common denominator.**
FCM04 **Compare two proper mixed numbers with the same whole number.**

Review   *Fractions: Comparing*

Compare fractions and mixed numbers -- renaming required.

FCM06   **Compare two fractions < 1.**
FCM07   **Compare two proper mixed numbers with different denominators.**

Review   Fractions:Comparing

Compare all kinds of fractions and mixed numbers.

FCM01   **Compare two fractions < 1 with common denominators.**
FCM02   **Compare two fractions < 1 with different denominators.**
FCM03   **Compare two proper mixed numbers with common denominators.**
FCM04   **Compare two proper mixed numbers with the same whole number.**
FCM06   **Compare two fractions < 1.**
FCM07   **Compare two proper mixed numbers with different denominators.**

Review   *Fractions: Improper and Mixed Numbers*

Rename improper fractions as mixed numbers and mixed numbers as improper fractions.

FMX03 **Write an improper fraction as a whole or a mixed number.**
FMX04 **Write a proper mixed number as an improper fraction.**
FMX05 **Rename a mixed proper fraction to a mixed improper fraction.**

Review *Fractions: Addition and Subtraction*

Add fractions horizontally.   Reducing may or may not be required.

FAS01 **Add two fractions < 1 with common denominator and sum < 1.   Reducing not required.   Horizontal.**
FAS03 **Add two fractions < 1 with common denominator and sum < 1.   Reducing required.   Horizontal.**

Fractions: Addition and Subtraction

FAS01 Add two fractions < 1 with common denominators and sum < 1. Reducing not required.   Horizontal.
FAS02 Add two fractions < 1 with common denominators and sum < 1. Reducing not required.   Vertical.
FAS03 Add two fractions < 1 with common denominators and sum < 1. Reducing required. Horizontal.
FAS04 Add two fractions < 1 with common denominators and sum < 1. Reducing required.   Vertical.
FAS05 Subtract two fractions < 1 with common denominators and sum < 1.   Reducing not required. Horizontal.

FAS06 Subtract two fractions < 1 with common denominators and sum < 1.   Reducing not required. Vertical.
FAS07 Subtract two fractions < 1 with common denominators and sum < 1.   Reducing required. Horizontal.
FAS08 Subtract two fractions < 1 with common denominators and sum < 1.   Reducing required.   Vertical.
FAS09 Add to fration < 1 with common denominators and sum > 1.   Reducing required.   Horizontal.
FAS10 Add to fration < 1 with common denominators and sum > 1.   Reducing required.   Vertical.
FAS11 Add two mixed numbers with common denominators.   Reducing required.   Fraction sum < 1. Horizontal.
FAS12 Add two mixed numbers with common denominators.   Reducing required.   Fraction sum < 1. Vertical.
FAS13 Subtract two mixed numbers with common denominators.   Reducing required.   Nor renaming. Horizontal.
FAS14 Subtract two mixed numbers with common denominators.   Reducing required.   Nor renaming. Vertical.
FAS15 Subtract a whole number from a mixed number.   Horizontal.
FAS16 Subtract a whole number from a mixed number.   Vertical.
FAS17 Add a mixed number and a fraction < 1 where the answer is a whole number.   Horizontal.
FAS18 Add a mixed number and a fraction < 1 where the answer is a whole number.   Vertical.
FAS19 Add mixed numbers with common denominators.   Renaming and reducing required.   Horizontal.
FAS20 Add mixed numbers with common denominators.   Renaming and reducing required.   Vertical.
FAS21 Subtract a fraction < 1 from 1.   Reducing required.   Vertical.
FAS22 Subtract a fraction < 1 from 1.   Reducing required.   Horizontal.
FAS23 Subtract a fraction < 1 from a whole number.   Reducing required.   Vertical.
FAS24 Subtract a fraction < 1 from a whole number.   Reducing required.   Horizontal.
FAS25 Subtract a mixed number from a whole number.   Lowest terms.   Vertical.
FAS26 Subtract a mixed number from a whole number.   Lowest terms.   Horizontal.
FAS27 Subtract two mixed numbers with common denominators.   Renaming and reducing required. Horizontal.
FAS28 Subtract two mixed numbers with common denominators.   Renaming and reducing required. Vertical.
FAS29 Add two fractions < 1.   One fraction is easily reduced.   Sum < 1.   Vertical.
FAS30 Add two fractions < 1.   One fraction is easily reduced.   Sum < 1.   Horizontal.
FAS31 Add two fractions < 1.   One fraction is easily reduced.   Sum > 1.   Vertical.
FAS32 Add two fractions < 1.   One fraction is easily reduced.   Sum > 1.   Horizontal.
FAS33 Add two mixed numbers.   One fraction is easily reduced.   No renaming or reducing required. Vertical.
FAS34 Add two mixed numbers.   One fraction is easily reduced.   No renaming or reducing required. Horizontal.
FAS35 Subtract two fractions < 1 with one denominator a multiple of the other.   No renaming.   Reducing required.   Vertical.
FAS36 Subtract two fractions < 1 with one denominator a multiple of the other.   No renaming.   Reducing required.   Horizontal.
FAS37 Subtract two mixed numbers.   One fraction is easily reduced.   No renaming or reducing required. Vertical.
FAS38 Subtract two mixed numbers.   One fraction is easily reduced.   No renaming or reducing required.

Horizontal.

<u>FAS39</u> **Subtract two mixed numbers.** **One fraction is easily reduced.** **Renaming and reducing required.**
Vertical.

<u>FAS40</u> **Subtract two mixed numbers.** **One fraction is easily reduced.** **Renaming and reducing required.**
Horizontal.

Review   *Fractions: Addition and Subtraction*

Subtract fractions horizontally.   Reducing may or may not be required.

FAS05 **Subtract two fractions < 1 with common denominators and sum < 1.   Reducing not required. Horizontal.**

FAS07 **Subtract two fractions < 1 with common denominators and sum < 1.   Reducing required. Horizontal.**

Review   *Fractions: Addition and Subtraction*

Add horizontally fractions that may or may not require renaming and reducing.

FAS01   **Add two fractions < 1 with a common denominator and sum < 1.   Reducing not required. Horizontal.**

FAS03   **Add two fractions < 1 with a common denominator and sum < 1.   Reducing required.   Horizontal.**

FAS09   **Add two fractions < 1 with a common denominator and sum > 1.   Reducing required.   Horizontal.**

Review   *Fractions:Addition and Subtraction*

Add and subtract mixed number with common denominators.   Problems presented vertically. Reducing is required.

FAS12   **Add two mixed numbers with common denominators.   Reducing required.   Vertical.**
FAS14   **Subtract two mixed numberd with common denominators.   Reducing required.   No renaming. Vertical.**

Review   *Fractions: Addition and Subtraction*

Add and subtract whole or mixed numbers from mixed numbers.

FAS12 **Add two mixed numbers with common denominators.   Fraction sum < 1.   Reducing required.   Vertical.**

FAS14 **Subtract two mixed numbers with common denominators.   Reducing required.   No renaming.   Vertical.**

FAS16 **Subtract whole number from mixed number.   Vertical.**

Review   *Fractions: Addition and Subtraction*

Add and subtract mixed numbers or fractions.   Reducing required.   Some renaming required. Vertical formats.

FAS08 **Subtract two fractions < 1 with common denominators and sum < 1.   Reducing required.   Vertical.**

FAS10 **Add two fractions < 1 with common denominator and sum > 1.   Reducing required.   Vertical.**

FAS14 **Subtract two mixed numbers with common denominators.   No renaming.   Reducing required. Vertical.**

FAS20 **Add mixed numbers with common denominators.   Renaming and reducing required.   Vertical.**

Review *Fractions: Addition and Subtraction*

Subtract mixed numbers from whole or mixed numbers.   Reducing and renaming required. Vertical.

FAS25   **Subtract a mixed number from a whole number.   Lowest terms.   Vertical.**
FAS28   **Subtract two mixed numbers with a common denominator.**

Review   *Decimals: Place Value*

Write fractions and mixed numbers as decimals.

DPV03 **Write a fraction in tenths or hundredths as a decimal < 1.**
DPV04 **Convert a mixed number with tenths or hundredths to a decimal.   Numbers between 1 and 10.**

Review   *Fractions: Division*

Mixed practice with multiplication and division of fractions and mixed numbers.

FML06 **Multiply two lowest terms fractions < 1.   Reducing required.   Fractions can be easily simplified before multiplication.**
FML07 **Multiply a mixed number and a fraction < 1.   Reducing required.**
FML08 **Multiply two mixed numbers.   Reducing required.**
FDV03 **Divide two lowest terms fractions < 1.   No reducing.   Quotient < 1.**
FDV04 **Divide two lowest terms fractions < 1.   Easily reduced.**
FDV07 **Divide a mixed number by a fraction.   Reducing required.**
FDV08 **Divide a fraction by a mixed number.   Reducing required.**
FDV09 **Divide two mixed numbers.   Reducing required.**

Review   *Fractions: Addition and Subtraction*

Review   *Fractions: Addition and Subtraction*

Add fractions with different denominators.   Sums either greater or less than 1.   Vertical formats.

FAS29   **Add two fraction < 1.   One fraction is easily reduced.   Sum < 1.   Vertical.**
FAS31   **Add two fractions < 1.   One fraction is easily reduced.   Sum > 1.   Vertical.**

Review   *Fractions: Addition and Subtraction*

Add fraction or mixed numbers with different denominators.   Reducing required.   Vertical formats.

FAS29   **Add two fractions < 1.   One fraction is easily reduced.   Sum < 1.   Vertical.**
FAS31   **Add two fractions < 1.   One fraction is easily reduced.   Sum > 1.   Vertical.**
FAS33   **Add two mixed numbers.   One fraction is easily reduced.   No renaming or reducing required. Vertical.**

Review   *Fractions: Addition and Subtraction*

Subtract fractions and mixed numbers.   Reducing required. Some renaming required.   Vertical and horizontal formats.

FAS36 **Subtract two fractions < 1 with one denominator a multiple of the other.   Reducing required.   No renaming.   Horizontal.**

FAS37 **Subtract two mixed numbers.   One fraction is easily reduced.   No renaming or reducing required.   Vertical.**

FAS38 **Subtract two mixed numbers.   One fraction is easily reduced.   No renaming or reducing required.   Horizontal.**

FAS39 **Subtract two mixed numbers.   One fraction is easily reduced.   Renaming and reducing required.   Vertical.**

FAS40 **Subtract two mixed numbers.   One fraction is easily reduced.   Renaming and reducing required.   Horizontal.**

Review   *Fractions: Division*

Mixed practice dividing fractions and mixed numbers of all kinds.   Reducing required.

FDV05 **Divide a whole number by a fraction.   Reducing required.**
FDV06 **Divide a fraction by a whole number.   Reducing required.**
FDV07 **Divide a mixed number by a fraction.   Reducing required.**
FDV08 **Divide a fraction by a mixed number.   Reducing required.**
FDV09 **Divide two mixed numbers.   Reducing required.**

Review   *Fractions: Division*

Divide a whole number by a fraction or a fraction by a whole number.   Reducing required.

<u>**FDV05**</u> **Divide a whole number by a fraction.   Reducing required.**
<u>**FDV06**</u> **Divide a fraction by a whole number.   Reducing required.**

FAS32

Find a common denominator then add.   Reduce your answer to lowest terms.

Sample Problem:

$$\frac{5}{8} + \frac{7}{16} = \frac{[\,]}{[\,]}$$

Hint:

Since the first denominator is a factor of the other, use the larger denominator as the common denominator.   Multiply to rename the first fraction.

Common denominator   = 16

$$\frac{5}{8} \cdot \frac{2}{2} = \frac{10}{16} \qquad \frac{7}{16} = \frac{7}{16}$$

.

Add the fractions, then divide the numerator by the denominator to express the answer as a mixed number.

$$\frac{10}{16} + \frac{7}{16} = \frac{17}{16} \qquad 16)\overline{17}^{\,1\,r\,1} = 1\frac{1}{16}$$

Solution:

$$\frac{5}{8} + \frac{7}{16} = 1\frac{|1|}{|16|}$$

Review   *Fractions: Division*

Divide fractions.   No reducing or easily reduced.

FDV03 **Divide two lowest terms fractions < 1.   No reducing.   Quotient < 1.**
FDV04 **Divide two lowest terms fractions < 1.   Easily reduced.**

Review   *Fractions: Addition and Subtraction*

Add and subtract mixed numbers.   Some renaming and reducing required.   Different denominators.   Vertical and horizontal formats.

FAS33   **Add two mixed numbers.   One fraction is easily reduced.   No renaming or reducing required. Vertical.**

FAS34   **Add two mixed numbers.   One fraction is easily reduced.   No renaming or reducing required. Horiozontal.**

FAS37   **Subtract two mixed numbers.   One fraction is easily reduced.   No renaming or reducing required. Vertical.**

FAS38   **Subtract two mixed numbers.   One fraction is easily reduced.   No renaming or reducing required. Horizontal.**

FAS39   **Subtract two mixed numbers.   One fraction is easily reduced.   Renaming and reducing required. Vertical.**

FAS40   **Subtract two mixed numbers.   One fraction is easily reduced.   Renaming and reducing required. Horizontal.**

Review   *Fractions: Addition and Subtraction*

Mixed practice with all kinds of addition and subtraction problems.   Some renaming and reducing required.   Denominators may or may not be the same.   Formats are mixed.

FAS19   **Add mixed numbers with common denominators.   Renaming and reducing required.   Horizontal.**
FAS20   **Add mixed numbers with common denominators.   Renaming and reducing required.   Vertical.**
FAS25   **Subtract a mixed number from a whole number.   Lowest terms.   Vertical.**
FAS26   **Subtract a mixed number from a whole number.   Lowest terms.   Horizontal.**
FAS27   **Subtract two mixed numbers with common denominators.   Renaming and reducing required.   Horizontal.**
FAS28   **Subtract two mixed numbers with common denominators.   Renaming and reducing required.   Vertical.**
FAS31   **Add two fractions < 1.   One fraction is easily reduced.   Sum > 1.   Vertical.**
FAS32   **Add two fractions < 1.   One fraction is easily reduced.   Sum > 1.   Horizontal.**
FAS33   **Add two mixed numbers.   One fraction is easily reduced.   No renaming or reducing required.   Vertical.**
FAS34   **Add two mixed numbers.   One fraction is easily reduced.   No renaming or reducing required.   Horizontal.**
FAS39   **Subtract two mixed numbers.   One fraction is easily reduced.   Renaming and reducing required.   Vertical.**
FAS40   **Subtract two mixed numbers.   One fraction is easily reduced.   Renaming and reducing required.   Horizontal.**

Review *Fractions: Multiplication*

Multiply all kinds of fractions.   Reducing required.

FML04 **Multiply two lowest terms fractions < 1.   Reducing required.**
FML05 **Multiply two lowest terms fractions < 1.   Reducing required.   One numerator and the other denominator are the same.**
FML06 **Multiply two lowest terms fractions < 1.   Reducing required.   Fractions can be easily simplified before multiplication.**

Review   *Fractions: Multiplication*

Multiply a mixed number by another mixed number or a fraction.   Reducing required.

FML07 **Multiply a mixed number and a fraction < 1.   Reducing required.**
FML08 **Multiply two mixed numbers.   Reducing required.**

Review *Fractions: Multiplication*

Mixed practice multiplying fractions and mixed numbers.   Reducing required.

FML04 **Multiply two lowest terms fractions < 1.   Reducing required.**
FML05 **Multiply two lowest terms fractions < 1.   Reducing required.   One numerator and the other denominator are the same.**
FML06 **Multiply two lowest terms fractions < 1.   Reducing required.   Fractions can be easily simplified before multiplication.**
FML07 **Multiply a mixed number and a fraction < 1.   Reducing required.**
FML08 **Multiply two mixed numbers.   Reducing required.**

Review   *Decimals: Place Value*

Convert fractions to decimals and decimals to fractions.   Reducing required.

DPV03 **Write a fraction in tenths or hundredths as a decimal < 1.**
DPV04 **Convert a mixed number with tenths or hundredths to a decimal.   Numbers between 1 and 10.**
DPV07 **Convert tenths or hundredths from a decimal to a mixed number.   Reducing required.   Numbers < 1 or from 1 to 10.**

Review   *Decimals: Place Value*

Convert fractions with tenths and hundredths to decimals.

DPV03 **Write a fraction in tenths or hundredths as a decimal < 1.**
DPV04 **Convert a mixed number with tenths or hundredths to a decimal.   Numbers between 1 and 10.**

Review   *Decimals: Place Value*

Write fractions with denominators 5, 8, and 20 as decimals.

DPV23 **Write decimals from fractions with denominator 8.**
DPV24 **Write decimals from fractions with denominator 5 or 20.**

Review   *Decimals: Place Value*

Write common fractions as decimals.

DPV22 **Write decimals from basic fractions < 1.   Round to the nearest hundredth.**

Review   *Decimals: Addition and Subtraction*

Add and subtract tenths from numbers with tenths.   No renaming.   Vertical and horizontal formats.

DAS05 **Add tenths to a whole number with tenths.   No renaming.   Numbers < 10.   Vertical.**
DAS06 **Add tenths to a whole number with tenths.   No renaming.   Numbers < 10.   Horizontal.**
DAS07 **Subtract tenths from a whole number with tenths.   No renaming.   Numbers < 10.   Vertical.**
DAS08 **Subtract tenths from a whole number with tenths.   No renaming.   Numbers < 10.   Horizontal.**

Review   *Decimals: Addition and Subtraction*

Add and subtract whole numbers and decimals with tenths.   Vertical and horizontal formats.

DAS09 **Add a whole number to a whole number with tenths.   Numbers < 10, answers < 20.   Vertical.**
DAS10 **Add a whole number to a whole number with tenths.   Numbers < 10, answers < 20.   Horizontal.**
DAS11 **Subtract a whole number with tenths from a whole number.   Numbers < 10, answers < 1.   Vertical.**
DAS12 **Subtract a whole number with tenths from a whole number.   Numbers < 10, answers < 1.**
     Horizontal.

Review   Decimals: Addition and Subtraction 12R2

Add and subtract tenths or whole numbers from decimals with tenths or whole numbers. Vertical and horizontal formats.

DAS05 **Add tenths to a whole number with tenths.   No renaming.   Numbers < 10.   Vertical.**
DAS06 **Add tenths to a whole number with tenths.   No renaming.   Numbers < 10.   Horizontal.**
DAS07 **Subtract tenths from a whole number with tenths.   No renaming.   Numbers < 10.   Vertical.**
DAS08 **Subtract tenths from a whole number with tenths.   No renaming.   Numbers < 10.   Horizontal.**
DAS09 **Add a whole number to a whole number with tenths.   Numbers < 10, answers < 20.   Vertical.**
DAS10 **Add a whole number to a whole number with tenths.   Numbers < 10, answers < 20.   Horizontal.**
DAS11 **Subtract a whole number with tenths from a whole number.   Numbers < 10, answers < 1.   Vertical.**
DAS12 **Subtract a whole number with tenths from a whole number.   Numbers < 10, answers < 1. Horizontal.**

Review   *Decimals: Addition and Subtraction*

Add and subtract decimals with tenths or hundredths.   No renaming.   Vertical and horizontal formats.

DAS13 **Add tenths to a whole number with hundredths. Numbers < 100.   Horizontal.**
DAS14 **Add two numbers with tenths and hundredths.   No renaming.   Numbers < 10.   Vertical.**
DAS15 **Add two numbers with tenths and hundredths.   No renaming.   Numbers < 10.   Horinzontal.**
DAS16 **Subtract two numbers with tenths and hundredths.   No renaming.   Numbers < 10.   Vertical.**
DAS17 **Subtract two numbers with tenths and hundredths.   No renaming.   Numbers < 10. Horizontal.**

Review   *Decimals: Addition and Subtraction*

Add and subtract numbers with decimals up to hundredths.   No renaming.   Horizontal format

DAS18 **Add two numbers with decimals up to hundredths, some only tenths.   Numbers < 10.   No renaming. Horizontal.**

DAS19 **Subtract two numbers with decimals up to hundredths, some only tenths.   Numbers < 10.   No renaming.   Horizontal.**

Review   Decimals: Addition and Subtraction

Add and subtract numbers with decimals up to hundredths.   If renaming, one time only. Vertical format.

DAS20 **Add two numbers with decimals up to hundredths, some only tenths.   Numbers < 10.   If renaming, one time only.   Vertical.**

DAS21 **Subtract two numbers with decimals up to hundredths, some only tenths.   Numbers < 10.   If renaming, one time only.   Vertical.**

Review   Decimals: Addition and Subtraction

Add and subtract numbers with decimals up to hundredths.   If renaming, one time only.
Vertical and horizontal formats.

DAS18 **Add two numbers with decimals up to hundredths, some only tenths.   Numbers < 10.   No renaming. Horizontal.**

DAS19 **Subtract two numbers with decimals up to hundredths, some only tenths.   Numbers < 10.   No renaming.   Horizontal.**

DAS20 **Add two numbers with decimals up to hundredths, some only tenths.   Numbers < 10.   If renaming, one time only.   Vertical.**

DAS21 **Subtract two numbers with decimals up to hundredths, some only tenths.   Numbers < 10.   If renaming, one time only.   Vertical.**

Review   *Decimals: Multiplication*

Multiply tenths, hundredths, or thousandths by a single-digit whole number.   Horizontal format.

DML03 **Multiply tenths by a single digit whole number.   Horizontal.**
DML05 **Multiply hundredths by a single digit whole number.   Tenths = 0.   Horizontal.**
DML07 **Multiply thousandths by a single digit whole number.   Tenths and hundredths = 0.   Horizontal.**

Review   *Decimals: Multiplication*

Multiply tenths or hundredths by tenths.   Vertical format.

DML08 **Multiply tenths by tenths.   Vertical.**
DML10 **Multiply hundredths where tenths = 0 by tenths.   Vertical.**

Review   *Decimals: Multiplication*

Multiply whole numbers, or numbers with tenths of thousandths by tenths.   Vertical formats.

DML02 **Multiply tenths by a single digit whole number.   Vertical.**
DML04 **Multiply hundredths by a single digit whole number.   Tenths = 0.   Vertical.**
DML06 **Multiply thousandths by a single digit whole number.   Tenths and hundredths = 0.   Vertical.**
DML08 **Multiply tenths by tenths.   Vertical.**
DML10 **Multiply hundredths where tenths = 0 by tenths.   Vertical.**

Review   *Decimals: Multiplication*

Multply a number with hundredths or thousandths by a whole number.   Vertical format.

<u>**DML15**</u> **Multiply hundredths where hundredth place = 0 , 5 by a whole number < 5.   Vertical.**
<u>**DML16**</u> **Multiply a decimal up to thousandths by a whole number < 5.   Thousandths place = 0 , 5.   Vertical.**

Review   *Decimals: Mutiplication*

Multiply numbers with up to thousandths by powers of 10 or whole numbers.

DML14 **Multiply a number with a decimal up to thousandths by .1, .01, .001, 10, 100 or 1000.**
DML15 **Multiply hundredths where hundredth place = 0 , 5 by a whole number < 5.   Vertical.**
DML16 **Multiply a decimal up to thousandths by a whole number < 5.   Thousandths place = 0 , 5.   Vertical.**

Review   *Decimals: Division*

Divide numbers with up to hundredths by one-digit whole numbers.

DDV01 **Divide a number < 10 with tenths by a one digit whole number.   No renaming.**
DDV02 **Divide a number < 10 with hundredths by a one digit whole number.   No renaming.   Each digit divides evenly**
DDV03 **Divide a number < 1 in hundredths by a one digit whole number.**

Review   *Decimals: Division*

Divide whole numbers or tenths into numbers with up to hundredths.   No remainders.

DDV02 **Divide a number < 10 with hundredths by a one digit whole number.   No renaming.   Each digit divides evenly**

DDV03 **Divide a number < 1 in hundredths by a one digit whole number.**

DDV04 **Divide a number < 10 with tenths by tenths.   Each digit goes evenly.**

DDV05 **Divide tenths into a one digit whole number.   No remainder.**

Review   *Decimals: Division*

Divide several types of numbers by hundredths.   Numbers divide evenly.

DDV06 **Divide hundredths where tenth = 0 into hundredths.   Divides evenly.**
DDV07 **Divide hundredths where tenth = 0 into number < 10.   Number divides in evenly.**
DDV08 **Divide hundredth where tenth = 0 into one digit whole number.   No remainder.**
DDV09 **Divide hundredth where tenth = 0 into a whole number < 100.   Number divides in evenly.**

Review   *Decimals: Division*

Divide several types of numbers by whole numbers, tenths, or hundredths.   Numbers divide evenly.

DDV02 **Divide a number < 10 with hundredths by a one digit whole number.   No renaming.   Each digit divides evenly**

DDV03 **Divide a number < 1 in hundredths by a one digit whole number.**

DDV04 **Divide a number < 10 with tenths by tenths.   Each digit goes evenly.**

DDV05 **Divide tenths into a one digit whole number.   No remainder.**

DDV06 **Divide hundredths where tenth = 0 into hundredths.   Divides evenly.**

DDV07 **Divide hundredths where tenth = 0 into number < 10.   Number divides in evenly.**

DDV08 **Divide hundredth where tenth = 0 into one digit whole number.   No remainder.**

DDV09 **Divide hundredth where tenth = 0 into a whole number < 100.   Number divides in evenly.**

Review   *Decimals: Division*

Divide numbers with thousandths, hundredths, tenths, or no decimals by thousandths.   Divide evenly.

DDV10 **Divide a number < 1 with thousandths by thousandths.   Hundredth and tenth = 0 in divisor.   Each digit divides evenly.**

DDV11 **Divide a number < 1 with hundredths by thousandths.   Hundredth and tenth = 0 in divisor.   Each digit divides evenly.**

DDV12 **Divide a number < 100 with tenths by thousandths.   Hundredth and tenth = 0 in divisor.   Each digit divides evenly.**

DDV13 **Divide a whole number < 10 by thousandths.   Hundredth and tenth = 0 in divisor.   Divides evenly.**

DDV14 **Divide a whole number < 100 by thousandth.   Hundredth and tenth = 0 in divisor.   Divides evenly.**

DDV15 **Divide a whole number < 1000 by thousandths.   Hundredth and tenth = 0 in divisor.   Each digit divides evenly.**

Review *Decimals: Divison*

Divide number with up to thousandths by whole numbers or decimal numbers up to thousandths. Numbers divide evenly.

DDV02 **Divide a number < 10 with hundredths by a one digit whole number.   No renaming.   Each digit divides evenly**

DDV03 **Divide a number < 1 in hundredths by a one digit whole number.**

DDV04 **Divide a number < 10 with tenths by tenths.   Each digit goes evenly.**

DDV05 **Divide tenths into a one digit whole number.   No remainder.**

DDV06 **Divide hundredths where tenth = 0 into hundredths.   Divides evenly.**

DDV07 **Divide hundredths where tenth = 0 into number < 10.   Number divides in evenly.**

DDV08 **Divide hundredth where tenth = 0 into one digit whole number.   No remainder.**

DDV09 **Divide hundredth where tenth = 0 into a whole number < 100.   Number divides in evenly.**

DDV10 **Divide a number < 1 with thousandths by thousandths.   Hundredth and tenth = 0 in divisor.   Each digit divides evenly.**

DDV11 **Divide a number < 1 with hundredths by thousandths.   Hundredth and tenth = 0 in divisor.   Each digit divides evenly.**

DDV12 **Divide a number < 100 with tenths by thousandths.   Hundredth and tenth = 0 in divisor.   Each digit divides evenly.**

DDV13 **Divide a whole number < 10 by thousandths.   Hundredth and tenth = 0 in divisor.   Divides evenly.**

DDV14 **Divide a whole number < 100 by thousandth.   Hundredth and tenth = 0 in divisor.   Divides evenly.**

DDV15 **Divide a whole number < 1000 by thousandths.   Hundredth and tenth = 0 in divisor.   Each digit divides evenly.**

Review   *Decimals: Division*

Multiply whole numbers, or numbers with tenths to thousandths by tenths.   Vertical formats.

DML02 **Multiply tenths by a single digit whole number.   Vertical.**
DML04 **Multiply hundredths by a single digit whole number.   Tenths = 0.   Vertical.**
DML06 **Multiply thousandths by a single digit whole number.   Tenths and hundredths = 0.   Vertical.**
DML08 **Multiply tenths by tenths.   Vertical.**
DML10 **Multiply hundredths where tenths = 0 by tenths.   Vertical.**

Review   *Decimals: Division*

Add and subtract numbers with decimals up to hundredths.   If renaming, one time only.
Vertical format.

DAS20 **Add two numbers with decimals up to hundredths, with some only tenths.   If renaming, one time only.   Numbers < 10.   Vertical.**

DAS21 **Subtract two numbers with decimals up to hundredths, with some only tenths.   If renaming, one time only.   Numbers < 10.   Vertical.**

Review   *Decimals: Division*

Multiply numbers with up to thousandths by powers of 10 or whole numbers.

DML14 **Multiply a number with a decimal up to thousandths by .1, .01, .001, 10, 100 or 1000.**
DML15 **Multiply hundredths where hundredth place = 0 , 5 by a whole number < 5.   Vertical.**
DML16 **Multiply a decimal up to thousandths by a whole number < 5.   Thousandths place = 0 , 5.   Vertical.**

Review   *Decimals: Division*

Divide numbers with thousandths, hundredths, tenths, or no decimals by thousandths.   Divide evenly.

DDV10 **Divide a number < 1 with thousandths by thousandths.   Hundredth and tenth = 0 in divisor.   Each digit divides evenly.**

DDV11 **Divide a number < 1 with hundredths by thousandths.   Hundredth and tenth = 0 in divisor.   Each digit divides evenly.**

DDV12 **Divide a number < 100 with tenths by thousandths.   Hundredth and tenth = 0 in divisor.   Each digit divides evenly.**

DDV13 **Divide a whole number < 10 by thousandths.   Hundredth and tenth = 0 in divisor.   Divides evenly.**

DDV14 **Divide a whole number < 100 by thousandth.   Hundredth and tenth = 0 in divisor.   Divides evenly.**

DDV15 **Divide a whole number < 1000 by thousandths.   Hundredth and tenth = 0 in divisor.   Each digit divides evenly.**

Review   *Decimals: Division*

Mixed operations with decimals.

DAS20   **Add two numbers with decimals up to hundredths, with some only tenths.   If renaming, one time only.   Numbers < 10.   Vertical.**

DAS21   **Subtract two numbers with decimals up to hundredths, with some only tenths.   If renaming, one time only.   Numbers < 10.   Vertical.**

DML08   **Multiply tenths by tenths.   Vertical.**

DML10   **Multiply hundredths where tenths = 0 by tenths.   Vertical.**

DDV13   **Divide a whole number < 10 by thousandths.   Hundredth and tenth = 0 in divisor.   Divides evenly.**

DDV14   **Divide a whole number < 100 by thousandth.   Hundredth and tenth = 0 in divisor.   Divides evenly.**

DDV15   **Divide a whole number < 1000 by thousandths.   Hundredth and tenth = 0 in divisor.   Each digit divides evenly.**

Review   *Percents*

Find various easy percents of whole numbers.

PCT13 **Find 10% of a whole number.   W = multiples of 10:   10 .. 500.**
PCT14 **Find 1% of a whole number.   W = whole numbers: 1 .. 500.**
PCT15 **Find the percent of a whole number.   X = 10, 25, 50, 75, 100.   n = whole number: 1 .. 20.**

Review   *Percents*

Mixed conversions of decimals, fractions, percents, and whole numbers.

PCT01 **Convert a written expression to a percent.   Numbers £ 100.**
PCT02 **Convert a decimal to a percent and vice versa.   Numbers .01 .. 1.00.**
PCT03 **Convert a fraction with denominator 100 to a percent and vice versa.   Numbers £ 100.
Denominators = 100.**
PCT04 **Write a whole number as a percent.   Numbers 0..10.**
PCT05 **Convert a fraction to a percent.   Numbers in thousandths or denominator = 100 then numerator is
between 101 and 999.**

Review   *Percents*

Convert all kinds of fractions to decimals and vice versa.

PCT08 **Reduce a fraction with denominator 100 to lowest form.   X = 10, 20, 25, 33 1/3, 50, 66 2/3, 75.**
PCT09 **Convert a common fraction to a percent.   Round to the nearest percent.**
PCT10 **Convert tenths to a percent.   x = 0..10. n=10x.**
PCT11 **Convert fifths to a percent.   x = 0..5.   n = 20x.**
PCT12 **Convert percent into lowest term fraction.   Variable x is a multiple of 5 or 20.**