COMMON DIVISOR.

48. An EXACT DIVISOR of a number, is a divisor which will divide it without a remainder.

49. A COMMON DIVISOR of two or more numbers, is a divisor which will divide each, separately, without a remainder.

50. The GREATEST COMMON DIVISOR of two or more numbers, is the greatest number that will divide each, separately, without a remainder.

To find the greatest common Divisor.

1. What is the greatest common divisor of 112 and 144?

Rule.

Divide the greater number by the less; and then divide the divisor by the remainder; and continue the operation till nothing remains. The last divisor will be the greatest common divisor of the two numbers.

OPERATION.

```
112) 144 (1
     112
     ---
      32) 112 (3
           96
          ---
           16) 32 (2
               32
```

2. What is the greatest common divisor of 75 and 275?
3. What is the greatest common divisor of 420 and 510?
4. Find the greatest common divisor of 216 and 316.
5. Find the greatest common divisor of 24 and 1956.
6. Find the greatest common divisor of 39 and 192.
7. What is the greatest common divisor of 1728 and 5000?
8. What is the greatest common divisor of 3750 and 5495?
9. What is the greatest common divisor of 960 and 1920?
10. What is the greatest common divisor of 376 and 495?
11. What is the greatest common divisor of 96 and 360?
12. What is the greatest common divisor of 113 and 7650?

COMMON FRACTIONS.

51. A UNIT is a single thing; as, 1 apple, 1 chair, 1 pound of tea; and is denoted by 1.

If a unit be divided into two equal parts, each part is called, *one-half.*

If a unit be divided into three equal parts, each part is called, *one-third.*

If a unit be divided into four equal parts, each part is called, *one-fourth.*

If a unit be divided into twelve equal parts, each part is called, *one-twelfth;* and if it be divided into *any number* of equal parts, we have a like expression for each part.

The parts are thus written:

$\frac{1}{2}$	is read,	one-half.	$\frac{1}{7}$	is read,	one-seventh.
$\frac{1}{3}$	. .	one-third.	$\frac{1}{8}$	. .	one-eighth.
$\frac{1}{4}$	. .	one-fourth.	$\frac{1}{10}$	. .	one-tenth.
$\frac{1}{5}$	. .	one-fifth.	$\frac{1}{15}$	. .	one-fifteenth.
$\frac{1}{6}$	. .	one-sixth.	$\frac{1}{50}$	. .	one-fiftieth.

52. The UNIT OF A FRACTION is the single thing that is divided into equal parts.

53. A FRACTIONAL UNIT is one of the equal parts of the unit that is divided.

54. A FRACTION is a fractional unit, or a collection of fractional units.

1. If an apple be divided into 30 equal parts, write the fractional unit.

2. If a pear be divided into 29 equal parts, write the fractional unit.

3. If a barrel of flour be divided into 19 equal parts, write the fractional unit.

4. If a yard of cloth be divided into 37 equal parts, write the fractional unit.

Writing Fractions.

$\frac{2}{3}$ is read,	2 thirds.	$\frac{9}{10}$ is read,	9 tenths.
$\frac{3}{4}$ . .	3 fourths.	$\frac{11}{13}$ . .	11 thirteenths.
$\frac{4}{5}$ . .	4 fifths.	$\frac{4}{17}$ . .	4 seventeenths.
$\frac{5}{6}$ . .	5 sixths.	$\frac{8}{9}$ . .	8 ninths.
$\frac{7}{8}$ . .	7 eighths.	$\frac{7}{16}$ . .	7 sixteenths.

55. The DENOMINATOR is the number written below the line, and shows into how many equal parts the unit of the fraction is divided.

56. The NUMERATOR is the number written above the line, and shows how many fractional units are taken.

57. The TERMS of a fraction are the numerator and denominator, taken together; hence, every fraction has two terms.

58. A whole number may be expressed fractionally, by writing 1 under it for a denominator. Thus,

3 may be written	$\frac{3}{1}$	and is read,	3 ones.
5	$\frac{5}{1}$	. . . .	5 ones.
6	$\frac{6}{1}$	. . . .	6 ones.
8	$\frac{8}{1}$	. . . .	8 ones.

59. Properties of Fractions.

1. All the parts of 1, however it may be divided, make up the unit itself; hence, any fractional unit, multiplied by the number of parts, is equal to 1.

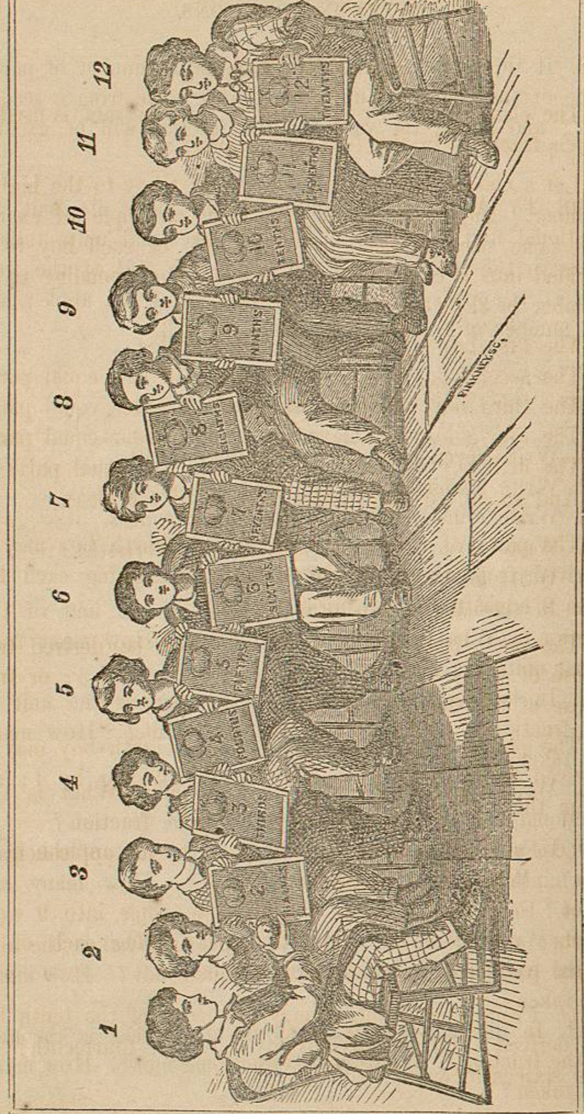
2. If the numerator is less than the number of parts, the value of the fraction is less than 1.

3. If the numerator is greater than the number of parts, some of the fractional units must have come from a second unit; and hence, the value of the fraction will be greater than 1.

60. To ANALYZE a fraction, is to name its unit, its fractional unit, and the number of fractional units taken: Thus, in the fraction $\frac{3}{4}$ of an apple, the unit of the fraction is 1 apple; the fractional unit, $\frac{1}{4}$ of an apple; and the number of fractional units taken, is 3.

Writing and Reading.

1. Write seven-eighths. Write three-fourths.
2. Write six-ninths. Write seven-fifteenths.
3. Write four-twelfths. Write nine-fifteenths.
4. Write seven-fourteenths. Write five-fortieths.
5. Write six-elevenths. Write nine-twelfths.
6. In six-fifths of an orange, what is the unit of the fraction? What is the fractional unit? How many fractional units are taken?
7. In twelve-fifteenths of a dollar, what is the unit of the fraction? What is the fractional unit? How many are taken?
8. Write eleven-thirteenths of a pound. What is the fractional unit? What is the unit of the fraction?
9. In nine-tenths of a yard, what is the unit of the fraction? What is the fractional unit? How many are taken?
10. Write fifteen-twentieths of a pear. What is the unit of the fraction? What is the fractional unit? How many are taken?
11. In nineteen-twentieths of an hour, what is the unit of the fraction? What is the fractional unit? How many are taken?



61. **Object Teaching.**

The class of boys, represented in the Diagram, is used to teach fractions in the following manner:

Let a class be numbered from the first boy to the highest number. Suppose each boy to have an apple of exactly the same size; and suppose the apple of each boy to be divided into a number of equal parts, corresponding to his number in the class: then,

The first boy will have the entire apple;
The second boy will have the apple in two equal parts;
The third boy will have the apple in three equal parts;
The fourth boy will have the apple in four equal parts;
The fifth boy will have the apple in five equal parts;
And so on, to the highest number of the class.

The parts of the apple held by the fourth boy may be derived from those of the second, by dividing each half into 2 equal parts, giving 4 fourths.

The parts held by the sixth boy may be derived from those of the second, by dividing each part by 3; or from those of the third, by dividing each part by 2.

The parts of the apple held by the eighth boy may be derived from those of the second, by dividing by 4; and from those of the fourth, by dividing by 2.

Q. From what boys may the parts of the apple held by the ninth boy be derived?

A. From the first, by dividing the apple into 9 equal parts; and from the third boy, by dividing each of his equal parts into 3 equal parts.

Q. From what numbers may the parts of the tenth boy be derived? Of the twelfth boy? Of the fourteenth? Of the sixteenth, &c.

Questions.

1. Which boy has the unit of the fraction?

2. What is the fractional unit corresponding to the second boy? How many has he?

3. What is the fractional unit corresponding to the third boy? How many has he?

4. What is the fractional unit corresponding to the fourth boy? How many has he?

5. What is the fractional unit corresponding to the tenth boy? How many has he?

6. What is the fractional unit corresponding to the twelfth boy? How many has he?

Writing the Fractions.

1. Write one of the equal parts of the boy number two.
2. Write two of the equal parts of number three.
3. Write five of the equal parts of number six.
4. Write nine of the equal parts of number ten.
5. Write twelve of the equal parts of number fourteen.
6. Write fifteen of the equal parts of number twenty.
7. Write thirty-nine of the equal parts of number fifty.
8. Write thirty-six of the equal parts of number 37.
9. Write sixty of the equal parts of number seventy-five.
10. Write forty-nine of the equal parts of number fifty.
11. Write sixty-nine of the equal parts of number 70.
12. Write thirty-eight of the equal parts of number 90.
13. Write 100 of the equal parts of number 100.
14. Write sixty-nine of the equal parts of number 75.
15. Write seventy-seven of the equal parts of number 80.
16. Write fifty-nine of the equal parts of number 60.
17. Write ninety-nine of the equal parts of number 101.
18. Write forty-nine of the equal parts of number 70.

62. Six Kinds of Fractions.

1. A Proper Fraction is one whose numerator is less than the denominator.

The following are proper fractions:

$$\tfrac{1}{2},\quad \tfrac{2}{3},\quad \tfrac{3}{4},\quad \tfrac{1}{5},\quad \tfrac{4}{7},\quad \tfrac{5}{8}.$$

2. An Improper Fraction is one whose numerator is equal to, or exceeds the denominator.

The following are improper fractions:

$$\tfrac{3}{3},\quad \tfrac{4}{3},\quad \tfrac{5}{4},\quad \tfrac{6}{5},\quad \tfrac{7}{4},\quad \tfrac{9}{8}.$$

3. A Simple Fraction is one whose numerator and denominator are both whole numbers.

The following are simple fractions:

$$\tfrac{1}{4},\quad \tfrac{3}{2},\quad \tfrac{5}{6},\quad \tfrac{8}{7},\quad \tfrac{9}{2},\quad \tfrac{8}{3}.$$

Note.—A simple fraction may be either proper or improper.

4. A Compound Fraction is a fraction of a fraction, or several fractions connected by the word *of*, or $\times$.

The following are compound fractions:

$$\tfrac{1}{2} \text{ of } \tfrac{1}{4},\quad \tfrac{1}{3} \text{ of } \tfrac{1}{2} \text{ of } \tfrac{1}{3},\quad \tfrac{1}{6}\times 3,\quad \tfrac{1}{7}\times\tfrac{1}{8}\times 4.$$

5. A Mixed Number is the sum of a whole number and a fraction.

The following are mixed numbers:

$$3\tfrac{1}{2},\quad 4\tfrac{1}{3},\quad 6\tfrac{2}{8},\quad 5\tfrac{3}{5},\quad 6\tfrac{5}{8},\quad 3\tfrac{1}{7}.$$

6. A Complex Fraction is one whose numerator or denominator is fractional; or, in which both are fractional.

63. Properties of Fractions, deduced from the Diagram.

Let us now see what use may be made of the diagram in illustrating the principles of Fractions: Remember,

1. That each boy of the class has the entire apple, divided into as many equal parts as are marked by his number;

2. That the apple is the unit of the fraction;

3. That each equal part of any apple, is a fractional unit;

4. That the denominator of *any fraction* will denote the number of some boy in a class;

5. That the numerator of such fraction will show how many fractional units are taken;

6. That we may pass from a larger to a smaller fractional unit, by multiplying the denominator, and from a smaller to a larger, by dividing the denominator.

64. By the aid of the above principles, the Diagram, and a sensible object to denote the unit of the fraction, the teacher can readily show to the class,

1. *That multiplying the numerator, multiplies the value of the fraction as many times as there are units in the multiplier:*

2. *That multiplying the denominator, diminishes the value of the fraction as many times as there are units in the multiplier:*

3. *That dividing the numerator, diminishes the value of the fraction as many times as there are units in the divisor:*

4. *That dividing the denominator, multiplies the value of the fraction as many times as there are units in the divisor:*

5. *That multiplying the numerator and denominator by the same number, does not alter the value of the fraction:* and

6. *That dividing the numerator and denominator by the same number, does not alter the value of the fraction.*

REDUCTION.

67. REDUCTION OF FRACTIONS is the operation of changing the fractional unit, without altering the value of the fraction.

1. How many halves are there in 2 units? Write them.
2. How many halves are there in 5 units? Write them.
3. How many thirds are there in 7 units? Write them.
4. How many sixths are there in 3 units? Write them.
5. How many eighths are there in 6 units? Write them.
6. How many twentieths are there in 2 units? Write them.
7. How many thirds are there in $2\frac{1}{3}$? Write them.
8. How many fourths are there in 3 and $\frac{3}{4}$? Write them.
9. How many sixths are there in 2 and $\frac{5}{6}$? Write them.
10. How many ninths are there in 3 and $\frac{4}{9}$? Write them.

CASE I.

68. **To reduce a whole number to a fraction having a given denominator.**

1. Reduce 7 to a fraction whose denominator shall be 5.

Rule.—*Multiply the whole number by the required denominator, and write the product over the denominator.*

OPERATION.

$5 \times 7 = 35.$

Ans. $\frac{35}{5}$.

Examples.

1. How many twentieths are there in 15?
2. Reduce 25 to sixteenths.
3. Reduce 47 to thirtieths.
4. How many fortieths are there in 75?
5. Reduce 29 to a fraction whose denominator shall be 18.
6. Reduce 112 to a fraction whose denominator shall be 63.

CASE II.

69. To reduce a mixed number to an improper fraction.

1. Reduce $4\frac{5}{6}$ to an improper fraction.

OPERATION.

$$\begin{array}{r} 4\frac{5}{6} \\ 6 \\ \hline 24 \\ 5 \\ \hline \frac{29}{6} = \end{array}$$

Rule.—*Multiply the whole number by the denominator of the fraction, to the product add the numerator, and place the sum over the denominator.*

Examples.

1. Reduce $5\frac{1}{7}$ to an improper fraction.
2. Reduce $6\frac{2}{3}$ to an improper fraction.
3. Reduce $10\frac{4}{5}$ to an improper fraction.
4. Reduce $16\frac{7}{9}$ to an improper fraction.
5. What fraction is equal to $18\frac{7}{8}$?
6. What fraction is equal to $25\frac{5}{6}$?
7. Reduce $37\frac{5}{8}$ yards to eighths of a yard.
8. Reduce $63\frac{7}{10}$ dollars to tenths of a dollar.
9. Reduce $45\frac{4}{11}$ and $28\frac{9}{10}$ to improper fractions.
10. Reduce $300\frac{4}{7}$ and $400\frac{7}{20}$ to improper fractions.
11. Reduce $25\frac{3}{4}$ and $16\frac{3}{5}$ to improper fractions.
12. Reduce $60\frac{7}{9}$ and $59\frac{11}{17}$ to improper fractions.

CASE III.

70. To reduce an improper fraction to a mixed number.

1. Reduce $\frac{14}{5}$ to a mixed number.

OPERATION.

$14 \div 5 = 2\frac{4}{5}$.

Rule.—*Divide the numerator by the denominator, and the quotient will be the whole or mixed number.*

Examples.

1. How many units are there in $\frac{8}{4}$? In $\frac{12}{6}$?
2. How many units are there in $\frac{16}{8}$? In $\frac{64}{32}$?
3. How many units are there in $\frac{32}{4}$? In $\frac{30}{15}$?
4. Reduce $\frac{25}{6}$ to a mixed number.
5. Reduce $\frac{38}{7}$ to a mixed number.
6. Reduce $\frac{54}{8}$ to a mixed number.
7. Reduce $\frac{73}{16}$ to a mixed number.
8. Reduce $\frac{112}{18}$ to a mixed number.
9. Reduce $\frac{750}{26}$ to a mixed number.
10. Find the value of $\frac{990}{160}$.
11. Find the value of $\frac{196}{24}$.
12. How many miles are equal to $\frac{725}{18}$ miles?
13. How many barrels are equal to $\frac{956}{7}$ barrels?
14. What number is equal to $\frac{1260}{430}$?
15. What number is equal to $\frac{816}{84}$?
16. Reduce $\frac{3896}{262}$ to a mixed number.
17. Find the value of $\frac{89475}{800}$ dollars.
18. Reduce $\frac{2002}{91}$ to a mixed number.

CASE IV.

71. To reduce a fraction to its lowest terms.

1. Reduce $\frac{16}{48}$ to its lowest terms.

1ST OPERATION.

$$\frac{2)\,16}{2)\,48} = \frac{8}{24}. \qquad \frac{8)\,8}{8)\,24} = \frac{1}{3}.$$

Rule.—*Divide the numerator and denominator by any number that will exactly divide them; divide the quotients in the same manner, until no number greater than 1 will exactly divide them:*

2D OPERATION.

$$\frac{16)\,16}{16)\,48} = \frac{1}{3}.$$

Or, *Divide both terms of the fraction by their greatest common divisor.*

Examples.

1. Reduce $\frac{18}{24}$.
2. Reduce $\frac{24}{30}$.
3. Reduce $\frac{56}{64}$.
4. Reduce $\frac{28}{84}$.
5. Reduce $\frac{56}{98}$.
6. Change $\frac{112}{144}$.
7. Reduce $\frac{160}{950}$.
8. Reduce $\frac{144}{1728}$.
9. Change $\frac{192}{486}$.
10. Reduce $\frac{510}{5610}$.
11. Reduce $\frac{75}{1000}$.
12. Reduce $\frac{160}{9000}$.
13. Reduce $\frac{175}{812}$.
14. Reduce $\frac{240}{875}$.
15. Reduce $\frac{419}{637}$.
16. Reduce $\frac{897}{1495}$.

CASE V.

72. To reduce a compound fraction to a simple one.

1. What is the value of $\frac{5}{6}$ of $\frac{3}{7}$?

Rule.—*Multiply the numerators together for a new numerator, and the denominators together for a new denominator.*

OPERATION.

$$\frac{5\times 3}{6\times 7}=\frac{15}{42}.$$

NOTE.—If there are mixed numbers, reduce them to their equivalent improper fractions.

By Cancellation.

2. Reduce $\frac{3}{7}$ of $\frac{7}{8}$ of $\frac{5}{3}$ to its lowest terms.

Rule.—*Cancel like factors in the numerator and denominator.*

OPERATION.

$$\frac{\cancel{3}}{\cancel{7}} \text{ of } \frac{\cancel{7}}{8} \text{ of } \frac{5}{\cancel{3}}=\frac{5}{8}.$$

Examples.

1. Reduce $\frac{3}{4}$ of $\frac{2}{6}$.
2. Reduce $\frac{1}{2}$ of $\frac{3}{4}$ of $\frac{3}{7}$.
3. Reduce $\frac{2}{3}$ of $\frac{3}{9}$ of $\frac{1}{8}$.
4. Reduce $2\frac{1}{2}$ of $\frac{4}{8}$.
5. Reduce $4\frac{1}{3}$ of $\frac{5}{7}$.
6. Reduce $5\frac{8}{6}$ of $\frac{2}{9}$.
7. Reduce $\frac{4}{9}$ of $\frac{5}{6}$.
8. Reduce $\frac{5}{8}$ of $\frac{9}{10}$.

9. A boy having $\frac{5}{8}$ of a dollar, gave away $\frac{2}{3}$ of his money: how much did he give away?

10. A cask holding $\frac{8}{9}$ of a hogshead, lost by leakage $\frac{2}{5}$ of its contents: how much was lost?

11. A man having $3\frac{3}{4}$ dollars, gave $\frac{2}{9}$ of his money for a dinner: what was the cost of his dinner?

CASE VI.

73. To reduce fractions having different denominators, to fractions having a common denominator.

1. Reduce $\frac{1}{2}$, $\frac{3}{4}$, and $\frac{5}{6}$ to a common denominator.

Rule.—*Multiply the numerator of each fraction by all the denominators except its own, for the new numerators, and all the denominators together for a common denominator.*

OPERATION.

$1\times 4\times 6=24$ 1st num.
$3\times 2\times 6=36$ 2d num.
$5\times 4\times 2=40$ 3d num.

$2\times 4\times 6=48$ com. den.

Ans. $\frac{24}{48}$, $\frac{36}{48}$, and $\frac{40}{48}$.

NOTES.—1. Before multiplying, reduce all fractions to simple fractions.

2. When the numbers are small, the work may be performed mentally: Thus:

$$\frac{1}{2},\ \frac{1}{4},\ \frac{2}{5},=\frac{20}{40},\ \frac{10}{40},\ \frac{16}{40}.$$

Examples.

1. Reduce $\frac{4}{7}$, $\frac{5}{6}$, and $\frac{1}{3}$.
2. Reduce $\frac{2}{5}$, $\frac{3}{2}$, and $\frac{2}{3}$.
3. Reduce $\frac{1}{7}$, $\frac{3}{8}$, and $\frac{1}{2}$.
4. Reduce $2\frac{1}{2}$ and $4\frac{1}{4}$.
5. Reduce $5\frac{1}{3}$ and $2\frac{3}{4}$.
6. Reduce $\frac{1}{2}$ of $\frac{2}{3}$ and $\frac{4}{5}$ of 6.
7. Reduce $\frac{3}{2}$ of 4 and $\frac{1}{3}$ of $5\frac{1}{2}$.
8. Reduce $\frac{6}{7}$ of 2 and 5.
9. Reduce $7\frac{1}{3}$ of 2 and 6.
10. Reduce $\frac{4}{2}$, $\frac{3}{9}$, and $\frac{4}{7}$.
11. Reduce $8\frac{1}{2}$ of 3 and $5\frac{1}{3}$.
12. Reduce $\frac{2}{3}$, $\frac{5}{6}$, and $\frac{4}{5}$.
13. Reduce $\frac{4}{7}$, $\frac{6}{9}$, and $\frac{1}{5}$.
14. Reduce $\frac{4}{8}$, $\frac{9}{12}$, and $\frac{3}{4}$.

ADDITION OF FRACTIONS.

74. Addition of Fractions is the operation of finding the sum of two or more fractions.

CASE I.

75. When the fractions have the same denominator.

1. What is the sum of $\frac{1}{3}$, $\frac{4}{3}$, and $\frac{7}{3}$?

Rule.—*Add the numerators, and place their sum over the common denominator.*

OPERATION.

$$1 + 4 + 7 = 12.$$

Ans. $\frac{12}{3} = 4.$

Examples.

1. Add $\frac{3}{4}$, $\frac{5}{4}$, and $\frac{7}{4}$.
2. Add $\frac{1}{2}$, $\frac{5}{2}$, and $\frac{7}{2}$.
3. Add $\frac{3}{5}$, $\frac{5}{5}$, $\frac{6}{5}$, and $\frac{9}{5}$.
4. Add $\frac{13}{9}$, $\frac{14}{9}$, and $\frac{17}{9}$.
5. Add $\frac{6}{15}$, $\frac{9}{15}$, $\frac{12}{15}$, and $\frac{17}{15}$.
6. Add $\frac{10}{13}$, $\frac{7}{13}$, $\frac{9}{13}$, and $\frac{15}{13}$.
7. Add $\frac{5}{8}$, $\frac{15}{8}$, $\frac{19}{8}$, and $\frac{17}{8}$.
8. Add $\frac{15}{11}$, $\frac{11}{11}$, and $\frac{12}{11}$.
9. Add $\frac{17}{16}$, $\frac{19}{16}$, $\frac{20}{16}$, and $\frac{11}{16}$.
10. Add $\frac{14}{20}$, $\frac{15}{20}$, and $\frac{30}{20}$.

CASE II.

76. When the denominators are unlike.

1. Add $\frac{3}{5}$, $\frac{2}{2}$, and $\frac{3}{4}$ together.

Rule.—I. *Reduce the fractions to a common denominator:*

II. *Add the numerators, and place their sum over the common denominator.*

OPERATION.

$3 \times 2 \times 4 = 24$ 1st num.
$2 \times 5 \times 4 = 40$ 2d num.
$3 \times 2 \times 5 = 30$ 3d num.
$5 \times 2 \times 4 = 40$ com. den.

$24 + 40 + 30 = 94$: hence, sum $= \frac{94}{40} = 2\frac{7}{20}$.

Examples.

1. Add $\frac{5}{6}$, $\frac{2}{3}$, and $\frac{7}{8}$.
2. Add $\frac{1}{9}$, $\frac{4}{7}$, and $\frac{1}{2}$.
3. $\frac{5}{6} + \frac{7}{9} =$ what?
4. $\frac{1}{10} + \frac{3}{4} + \frac{11}{12} =$ what?
5. Add $\frac{2}{7}$ of $\frac{2}{3}$ and $\frac{7}{2}$ of $\frac{4}{5}$.
6. Add $\frac{5}{9}$ of $\frac{3}{4}$ and $\frac{2}{3}$ of $\frac{3}{6}$.
7. Add $\frac{3}{5}$, $\frac{6}{6}$, and $\frac{4}{10}$.
8. Add $\frac{5}{2}$ and $\frac{3}{4}$.
9. Add $\frac{2}{3}$, $\frac{3}{7}$, and $\frac{5}{8}$.
10. Add $\frac{5}{9}$, $\frac{6}{7}$, and $\frac{3}{2}$.
11. Add $\frac{4}{7}$, $\frac{3}{6}$, and 2.
12. Add $\frac{5}{9}$, $\frac{6}{2}$, and $\frac{1}{3}$.
13. Add $\frac{4}{5}$, $\frac{5}{9}$, and $\frac{3}{7}$.
14. Add $\frac{2}{3}$, $\frac{5}{9}$, and $\frac{1}{7}$.

CASE III.

77. When mixed numbers are to be added.

1. Add $4\frac{1}{2}$, $5\frac{1}{3}$, and $6\frac{1}{4}$ together.

Rule.—*Add the whole numbers and fractions separately, and then unite their sums.*

OPERATION.

$4 + 5 + 6 = 15.$
$\frac{1}{2} + \frac{1}{3} + \frac{1}{4} = \frac{13}{12}.$
Ans. $15\frac{13}{12} = 16\frac{1}{12}.$

Examples.

1. Add $4\frac{1}{3}$, $5\frac{1}{2}$, and $\frac{1}{4}$.
2. Add $3\frac{1}{5}$, $6\frac{1}{7}$, and $3\frac{2}{9}$.
3. Add $\frac{3}{8}$, $5\frac{4}{9}$, and $6\frac{7}{8}$.
4. Add $4\frac{3}{5}$, $6\frac{2}{9}$, and $\frac{1}{7}$.
5. Add $\frac{4}{5}$, $6\frac{7}{8}$, and $5\frac{6}{7}$.
6. Add $5\frac{3}{7}$, $6\frac{1}{3}$, and $\frac{6}{7}$.
7. Add $3\frac{1}{7}$, $5\frac{1}{8}$, and $\frac{1}{4}$.
8. Add $2\frac{1}{2}$, $4\frac{1}{7}$, and 4.
9. Add $7\frac{7}{8}$, $\frac{1}{2}$, and $6\frac{4}{5}$.
10. Add $9\frac{4}{7}$, $3\frac{1}{6}$, and $\frac{4}{9}$.

Practical Questions.

1. James pays $\frac{3}{7}$ of a dollar for a pair of gloves, and $\frac{3}{8}$ of a dollar for a handkerchief: how much do they cost him?

2. Nancy buys a work-box for $\frac{7}{8}$ of a dollar, a pair of gloves for $\frac{3}{8}$ of a dollar, and a comb for $\frac{2}{16}$ of a dollar: how much do they all cost?

3. Jane buys a yard of ribbon for $\frac{2}{7}$ of a dollar, a gold