CHAPTER TWO

FRACTIONS

ADDITION:

Evaluate the following fractions:

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

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

5. $1\frac{1}{2}+\frac{1}{4}=$ 6. $2^{2}/_{3}+1^{1}/_{3}=$

7. $3\frac{1}{2}+1^{1}/_{3}=$ 8. $4\frac{1}{2}+1^{1}/_{4}=$

Soln.

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

$\frac{2+1}{4}=\frac{3}{4}\frac{4+3}{6}=\frac{7}{6}=1^{1}/_{6}$

3. $\frac{3}{4}+\frac{2}{3}$ 4. $\frac{3}{5}+\frac{2}{3}$

$\frac{9+8}{12}=\frac{17}{12}=1^{5}/_{12}\frac{9+10}{15}=\frac{19}{15}=1^{4}/_{15}$

5. $1\frac{1}{2}+\frac{1}{4}$ 6. $2^{2}/_{3}+1^{1}/_{3}$ ‘

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

$\frac{6+1}{4}=\frac{7}{4}=1^{3}/_{4}$ $\frac{8+4}{3}=\frac{12}{3}=4$

7. $3\frac{1}{2}+1^{1}/_{3}=\frac{7}{2}+\frac{4}{3}$ 8. $4\frac{1}{2}+1\frac{1}{4}=\frac{9}{2}+\frac{5}{4}$

$\frac{21+8}{6} = \frac{29}{6} = 4^{5}/_{6} \frac{18+5}{4} = \frac{23}{4} = 5^{3}/_{4}$

Q2. Evaluate the following fractions:

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

3. $\frac{2}{3} + \frac{1}{6} + \frac{3}{4}$ 4. $1½ + 2^{2}/_{3} + {}^{1}/_{6}$

5. $2½ + 1^{1}/_{3} + 1^{3}/_{4}$ 6. $1¼ + 1^{1}/_{5} + 1^{2}/_{10}$

7. $1^{1}/_{5} + 3^{2}/_{3} + 2^{1}/_{2}$ 8. $3¼ + 2^{1}/_{2} + 1^{1}/_{8}$

Soln.

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

$\frac{10+15+12}{30} = \frac{37}{30} = 1^{7}/_{3} \frac{5+10+8}{20} = \frac{23}{20} = 1^{3}/_{20}$

3. $\frac{2}{3} + \frac{1}{6} + \frac{3}{4}$ 4. $1½ + 2^{2}/_{3} + \frac{1}{6}$

$\frac{8+2+9}{12} = \frac{19}{12} = 1^{7}/_{12} \frac{3}{2} + \frac{8}{3} + \frac{1}{6} = \frac{9+16+1}{6} = \frac{26}{6} = 4^{2}/_{6} = 4^{1}/_{3}$

5. $2½ + 1^{1}/_{3} + 1^{3}/_{4}$ 6. $1¼ + 2^{1}/_{5} + 1^{1}/_{10}$

$= \frac{5}{2} + \frac{4}{3} + \frac{7}{4}$ $= \frac{5}{4} + \frac{11}{5} + \frac{12}{10}$

$\frac{30+16+21}{12} = \frac{67}{12} = 5^{7}/_{12} = \frac{93}{20}$

$= 4^{13}/_{20}$

7. $1^{1}/_{5} + 3^{2}/_{3} + 2^{1}/_{2}$ 8. $3¼ + 2½ + 1^{1}/_{8}$

$= \frac{6}{5} + \frac{11}{3} + \frac{5}{2} = \frac{13}{4} + \frac{5}{2} + \frac{9}{8}$

$= \frac{36+110+75}{30} = \frac{221}{30} = 7\frac{11}{30}$ $= \frac{26+20+9}{8} = \frac{55}{8} = 6\frac{7}{8}$

SUBTRACTION:

Q1. Evaluate the following:

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

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

5. $2^2/_3 - 1^1/_3 =$ 6. $3^1/_2 - 3^1/_3$

7. 4½ - 1¼ = 8. 1¾ - $1^2/_3$ =

Soln.

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

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

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

. $\frac{9-8}{12} = \frac{1}{12}$ $\frac{10-9}{15} = \frac{1}{15}$

5. $2^2/_3 - 1^1/_3$ 6. $3^1/2 - 3\,^1/_2$

$= \frac{8}{3} - \frac{4}{3} = \frac{8-4}{3} = \frac{4}{3} = 1\frac{1}{3}\frac{7}{2} - \frac{10}{3} = \frac{21-20}{6} = \frac{1}{6}$

7. 4½ - 1¼ 8. 1¾ - $1^2/_3$

$= \frac{9}{2} - \frac{5}{4}$ $= \frac{7}{4} - \frac{5}{3}$

$\frac{18-5}{4} = \frac{13}{4} = 3\frac{1}{4}$ $= \frac{21-20}{12} = \frac{1}{12}$

.

Q2. Find the values of the following fractions:

1. $\frac{1}{2}-\frac{1}{3}-\frac{2}{15}$ 2. $\frac{1}{2}-\frac{1}{4}-\frac{1}{10}$

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

5. $\frac{1}{2}-\frac{1}{12}-\frac{1}{3}$ 6. $3\frac{1}{2}-1\frac{1}{4}-1\frac{1}{2}$

Soln.

1. $\frac{1}{2}-\frac{1}{3}-\frac{2}{15}$

$\frac{15-10-4}{30}=\frac{1}{30}$

2. $\frac{1}{2}-\frac{1}{4}-\frac{1}{10}$

$\frac{10-5-2}{20}=\frac{3}{20}$

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

$\frac{18-3-4}{12}=\frac{11}{12}$

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

$\frac{7}{3}-\frac{4}{3}-\frac{3}{2}=\frac{14-8-9}{6}$

$$=\frac{6-9}{6}=-\frac{3}{6}=-\frac{1}{2}$$

5. $\frac{1}{2}-\frac{1}{12}-\frac{1}{3}$

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

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

$\frac{7}{2}-\frac{5}{4}-\frac{3}{2}=\frac{14-5-6}{4}=\frac{3}{4}$

MULTIPLICATION OF FRACTIONS:

N/B: In fraction multiplication, the top numbers are multiplied together, and the downward ones are also multiplied together.

Q1.Evaluate the following:

1. $\frac{1}{3}\times\frac{1}{2}$ 2. $\frac{2}{3}\times\frac{1}{4}$

3. $\frac{2}{4} \times \frac{3}{5}$ 4. $\frac{4}{6} \times \frac{3}{4}$

5. $\frac{5}{6} \times \frac{4}{6}$ 6. $\frac{5}{8} \times \frac{3}{10}$

7. $\frac{2}{3} \times \frac{1}{4} \times \frac{1}{2}$ 8. $\frac{1}{2} \times \frac{1}{3} \times \frac{1}{4}$

9. $\frac{2}{3} \times \frac{2}{4} \times \frac{5}{6}$ 10. $\frac{3}{2} \times \frac{4}{5} \times \frac{2}{3}$

Soln.

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

3. $\frac{2}{4} \times \frac{3}{5} = \frac{6}{20}$ 4. $\frac{4}{6} \times \frac{3}{4} = \frac{12}{24}$

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

5. $\frac{5}{6} \times \frac{4}{6} = \frac{20}{36} = \frac{10}{18}$ 6. $\frac{5}{8} \times \frac{3}{10} = \frac{15}{80} = \frac{3}{16}$

7. $\frac{2}{3} \times \frac{1}{4} \times \frac{1}{2}$ 8. $\frac{1}{2} \times \frac{1}{3} \times \frac{1}{4} = \frac{1}{24}$

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

9. $\frac{2}{3} \times \frac{2}{4} \times \frac{5}{6}$ 10. $\frac{3}{2} \times \frac{4}{5} \times \frac{2}{3}$

$= \frac{20}{72} = \frac{5}{18}$ $= \frac{24}{30} = \frac{12}{15}$

Q2. Evaluate the following fractions:

1. $1\frac{1}{2} \times 1\frac{3}{4}$ 2. $2\frac{1}{3} \times 1\frac{2}{3}$

3. $2\frac{1}{3} \times 1\frac{2}{5}$ 4. $1\frac{1}{4} \times 2\frac{2}{3} \times \frac{2}{3}$

5. $1\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{2}{3}$ 6. $2\frac{1}{4} \times 1\frac{1}{3} \times 2\frac{2}{3}$

Soln.

1. $1\frac{1}{2} \times 1\frac{3}{4}$

$= \frac{3}{2} \times \frac{7}{4} = \frac{21}{8} = 2\frac{5}{8}$

2. $2\frac{1}{3} \times 1\frac{2}{3}$

$= \frac{7}{3} \times \frac{5}{3} = \frac{35}{9} = 3\frac{8}{9}$

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

$= \frac{49}{15} = 3\frac{4}{5}$

4. $1\frac{1}{4} \times 2\frac{2}{3} \times \frac{2}{3}$

$= \frac{5}{4} \times \frac{8}{3} \times \frac{2}{3} = \frac{80}{36}$

$= \frac{20}{9} = 2\frac{2}{9}$

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

$= \frac{3}{2} \times \frac{5}{2} \times \frac{5}{3} = \frac{75}{12}$

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

6. $2\frac{1}{4} \times 1\frac{1}{3} \times 1\frac{1}{2}$

$= \frac{9}{4} \times \frac{4}{3} \times \frac{3}{2} = 4\frac{1}{2}$

DIVISION OF FRACTIONS:

N/B: In fraction division, the dividing fraction i.e the one on the right is turned upside down, and the division sign or symbol is then changed into the multiplication sign.

Solve the following:

1. $\frac{2}{6} \div \frac{4}{3}$ 2. $\frac{3}{4} \div \frac{6}{2}$

3. $\frac{2}{8} \div \frac{3}{4}$ 4. $1\frac{1}{3} \div 1\frac{3}{5}$

5. $2\frac{1}{2} \div 3\frac{1}{3}$ 6. $2\frac{1}{4} \div \frac{3}{2}$

Soln.

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

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

3. $\frac{2}{8} \div \frac{3}{4} = \frac{2}{8} \times \frac{4}{3}$ 4. $1\frac{1}{3} \div 1\frac{3}{5} = \frac{4}{3} \div \frac{8}{5}$

$= \frac{8}{24} = \frac{1}{3}$ $= \frac{4}{3} \times \frac{5}{8} = \frac{20}{24} = \frac{5}{6}$

5. $2\frac{1}{2} \div 3\frac{1}{3} = \frac{5}{2} \div \frac{10}{3}$ 6. $2\frac{1}{4} \div \frac{3}{2} = \frac{9}{4} \div \frac{3}{2}$

$= \frac{5}{2} \times \frac{3}{10} = \frac{3}{4}$ $= \frac{9}{4} \div \frac{3}{2} = \frac{9}{4} \times \frac{2}{3} = \frac{9}{6} = 1\frac{1}{2}$

BODMAS:

B = bracket m = multiplication

O = of a = addition

D = division s = subtraction.

- In solving fraction problems which involve two or more different symbols, the principle of Bodmas is used.
- Fractions within brackets must be solved first, before those involving of, or multiplication
- Also those involving multiplication must be solved before those involving addition or subtraction and so on.
- Take note of the fact that of must be changes into multiplication.

Q1. Evaluate the following:

1. $\frac{1}{2} \times \frac{2}{4} + \frac{1}{8}$ 2. $\frac{1}{3} + \frac{2}{6} - \frac{1}{4}$

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

5. $2\frac{1}{2} - \frac{1}{4} \div \frac{2}{4}\ of \frac{1}{3}$

6. $\frac{3}{2}\ of \frac{4}{6} + \frac{1}{3} - \frac{1}{2} \div \frac{3}{4}$

7. $1\frac{1}{3} + \frac{1}{2} - \frac{3}{4} \div \frac{3}{2}$

8. $\left(\frac{1}{2} + \frac{3}{4}\right)\ of\ 1\frac{1}{3} + \frac{1}{2} - \frac{2}{3} \div \frac{1}{6}$

9. $\left(2\frac{1}{4} - 1\frac{3}{4}\right) - \frac{1}{4} + \frac{3}{4} \times \left(\frac{2}{4} \div \frac{3}{4}\right)$

10. $\left(\frac{3}{5}\ of \frac{1}{2}\right) \times \frac{1}{3} \div \frac{2}{3} \times \frac{1}{4}$

Soln.

1. $\frac{1}{2} \times \frac{2}{4} + \frac{1}{8}$ Since multiplication comes before addition, we solve it first.

$$\therefore \frac{1}{2} \times \frac{2}{4} = \frac{2}{8} \Rightarrow \frac{2}{8} = \frac{1}{4}$$

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

2. $\frac{1}{3} + \frac{2}{6} - \frac{1}{4}$, Addition comes before subtraction, so solve it first.

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

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

$= \frac{8-3}{12} = \frac{5}{12}$

3. $\frac{2}{3}\ of\ \frac{1}{2} + \frac{2}{3}$ Solving the of first $=> \frac{2}{3}\ of\ \frac{1}{2}$

$= \frac{2}{3} \times \frac{1}{2} = \frac{1}{3} => \frac{2}{3}\ of\ \frac{1}{2} + \frac{2}{3} = \frac{1}{3} + \frac{2}{3}$

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

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

solve what is inside the bracket first

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

$=> \left(\frac{1}{2} + \frac{3}{4}\right) \times \frac{2}{3} \div \frac{6}{3} = \frac{5}{4} \times \frac{2}{3} \div \frac{6}{2}$

next we take the division sign

$=> \frac{2}{3} \div \frac{6}{2} = \frac{2}{3} \times \frac{2}{6} = \frac{2}{9}$

$\therefore \frac{5}{4} \times \frac{2}{3} \div \frac{6}{2} = \frac{5}{4} \times \frac{2}{9} = \frac{5}{18}$

5. $2\frac{1}{2} - \frac{1}{4} \div \frac{2}{4}\ of\ \frac{1}{3}$

Soln.

Solve the of first $=> \frac{2}{4}\ of\ \frac{1}{3} = \frac{2}{12} = \frac{1}{6}$

$=> 2\frac{1}{2} - \frac{1}{4} \div \frac{2}{4}\ of\ \frac{1}{3} = 2\frac{1}{2} - \frac{1}{4} \div \frac{1}{6}$

Next we deal with the division

$\frac{1}{4} \div \frac{1}{6} = \frac{1}{4} \times \frac{6}{1} = \frac{3}{2} => 2\frac{1}{2} - \frac{1}{4} \div \frac{1}{6}$

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

6. $\frac{3}{2}\ of\ \frac{4}{6} + \frac{1}{2} \div \frac{3}{4}$

.

Soln.

First solve the of $\Rightarrow \frac{3}{2} of \frac{4}{6} = \frac{3}{2} \times \frac{4}{6} = 1 = \frac{1}{1}$

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

Next deal with the division $\frac{1}{2} \div \frac{3}{4} = \frac{1}{2} \times \frac{4}{3} = \frac{2}{3}$

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

7. $1\frac{1}{3} + \frac{1}{2} - \frac{3}{4} \div \frac{3}{2}$

Soln.

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

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

Now deal with the addition

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

$\frac{8+3}{6} = \frac{11}{6}$

$\Rightarrow 1\frac{1}{3} + \frac{1}{2} - \frac{1}{2} = \frac{11}{6} - \frac{1}{2}$

$\therefore \frac{11}{6} - \frac{1}{2} \rightarrow \frac{11-3}{6} = \frac{8}{6} = \frac{4}{3} = 1\frac{1}{3}$

Q8. $\left(\frac{1}{2}+\frac{3}{4}\right) of\ 1\frac{1}{3}+\frac{2}{3}-\frac{1}{6}$

Soln.

Dealing with the bracket

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

$\therefore \left(\frac{1}{2}+\frac{3}{4}\right)\ of\ 1\frac{1}{3}+\frac{2}{3}-\frac{1}{6}= \ \frac{5}{4}\ of\ 1\frac{1}{3}+\frac{2}{3}-\frac{1}{6}$

Next deal with the of $=> \frac{5}{4} of\ 1\frac{1}{3}=\frac{5}{4}\times\frac{4}{3}=\frac{5}{3}$

$$=> \frac{5}{4}\ of\ 1\frac{1}{3}+\frac{2}{3}-\frac{1}{6}=\frac{5}{3}+\frac{2}{3}-\frac{1}{6}$$

Now deal with the addition $\frac{5}{3}+\frac{2}{3}$

$$\frac{5+2}{3}=\frac{7}{3}\rightarrow\frac{5}{3}+\frac{2}{3}-\frac{1}{6}=\frac{7}{3}-\frac{1}{6}$$

$$\frac{14-1}{6}=\frac{13}{6}=2\frac{1}{6}$$

Q9. $\left(2\frac{1}{4}-1\frac{3}{4}\right)-\frac{1}{4}+\frac{3}{4}\times\left(\frac{2}{4}\div\frac{3}{4}\right)$

Soln.

Deal with two brackets first

$$\left(2\frac{1}{4}-1\frac{3}{4}\right)=\frac{9}{4}-\frac{7}{4}$$

$$=\frac{9-7}{4}=\frac{2}{4}=\frac{1}{2}$$

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

$$\therefore \left(2\frac{1}{4}-1\frac{3}{4}\right)-\frac{1}{4}+\frac{3}{4}\times\left(\frac{2}{3}\div\frac{3}{4}\right)$$

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

Next deal with the multiplication

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

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

Now deal with the addition

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

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

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

Q10. $\left(\frac{3}{5}\ of\ \frac{1}{2}\right) \times \frac{1}{3} \div \frac{2}{3} \times \frac{1}{4}$

Soln.

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

$$=> \left(\frac{3}{5}\ of\ \frac{1}{2}\right) \times \frac{1}{3} \div \frac{2}{3} \times \frac{1}{4}$$

$$= \frac{3}{10} \times \frac{1}{3} \div \frac{2}{3} \times \frac{1}{4}$$

Next deal with the division

$\therefore \frac{1}{3} \div \frac{2}{3} = \frac{1}{3} \times \frac{3}{2} = \frac{1}{2} => \frac{3}{10} \times \frac{1}{3} \div \frac{2}{3} \times \frac{1}{4}$

$= \frac{3}{10} \times \frac{1}{2} \times \frac{1}{4} = \frac{3}{80}$

Q11. Simplify the following:

(a) $37\frac{1}{2} \div \frac{5}{9}\ of\ \left(\frac{4}{7} + \frac{1}{5}\right) - 80\frac{1}{3}$

(b) $(4\frac{3}{4} - 1\frac{5}{6}) \div 1\frac{1}{24} \times (1\frac{2}{3} + 2\frac{1}{2})$

Hint: Solve whatever you have in the two brackets first and then continue to apply the BODMAS principle.

(c) $\frac{\frac{3}{4} - \frac{7}{8} + \frac{1}{2}}{\frac{3}{4}\ of\ \left(\frac{7}{8} - \frac{1}{2}\right)}$

Hint: Simplify the top part to get an answer, and do a similar thing to the down part. Then divide the answer you had for the top part by the one you had for the down part.

Arrangement of fractions in the ascending and the descending order:

N/B:

- First find the L.C.M to know the value of each fraction.
- To arrange a group of fractions in the ascending order means to arrange from the lowest to the highest.
- To arrange in the descending order, we start with the highest fraction to the lowest one.

Arrangement in ascending order:

Q1. Arrange the following fractions in the ascending order:

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

Soln.

$\frac{1}{2}, \frac{3}{4}, \frac{1}{4} \Rightarrow \frac{2,3,\ 1}{4}$

Ans: $\frac{1}{4},\ \frac{1}{2},\ \frac{3}{4}$

N/B: - To get the value 2, consider the ½ . Use the number down or the denominator to divide the L.C.M or the 4 i.e $= 2$.

- Multiply this 2 with the top number or the numerator i.e $1 \Rightarrow 2 \times 1 = 2$.
- To get the value of 3, consider the $\frac{3}{4}$ and use the 4 to divide the L.C.M ie $\frac{4}{4} = 1$.
- Multiply this 1 with the top number ie $1 \times 3 = 3$.
- Lastly for the value of 1, consider the ¼ and divide the L.C.M using the 4 to get 1.
- Multiply this using the numerator or the top number or the 1, i.e 1 x 1 = 1.

Q2. Arrange the following fractions in the ascending order: $\frac{2}{3},\ \frac{5}{6},\ \frac{3}{4}$

Soln.

$\frac{2}{3}, \quad \frac{5}{6}, \quad \frac{3}{4}$

$\frac{8,\ 10,\ 9}{12}$ Ans: $\frac{2}{3},\ \frac{3}{4}, \frac{5}{6}$

Q3. Arrange these fractions from the lowest to the highest: $\frac{1}{4},\ \frac{2}{4},\ \frac{4}{5},\ \frac{3}{10}$

Soln.

$\frac{1}{4}, \quad \frac{2}{4}, \quad \frac{4}{5}, \quad \frac{3}{10}$

$\frac{5,\ 10,\ 16,\ 6}{20}$ Ans: $\frac{1}{4},\ \frac{3}{10},\ \frac{2}{4},\ \frac{4}{5}$

Q4. Arrange these fractions in the ascending order:

1½, 1¾, $1\frac{2}{3}$

N/B: Change these fractions first into improper fractions before finding the L.C.M

Soln.

$1½, 1¾, 1\frac{2}{3}$

$= \frac{3}{2}, \quad \frac{7}{4}, \quad \frac{5}{3}$

$$\frac{18,\ 21,\ 20}{12}$$

Ans: $1\frac{1}{2}, 1\frac{2}{3}, 1\frac{3}{4}$

Q5. Arrange the following in ascending order: $2\,{}^{2}/_{3}, 2\,{}^{1}/_{3}, 2\,{}^{4}/_{5}, 2\,{}^{3}/_{5}$

Soln.

$2\,{}^{2}/_{3}, 2\,{}^{1}/_{3}, 2\,{}^{4}/_{5}, 2\,{}^{3}/_{5}$

$= \frac{8}{3}, \quad \frac{7}{3}, \quad \frac{14}{5}, \quad \frac{13}{5}$

$$\frac{40,\ 35,\ 42,\ 39}{15}$$

Ans: $\frac{7}{3}, \quad \frac{13}{5}, \quad \frac{8}{3}, \quad \frac{14}{5}$

$= 2\frac{1}{3}, \quad 2\frac{3}{5}, \quad 2\frac{2}{3}, \quad 2\frac{4}{5}$

Q6. Arrange $\frac{1}{5} and \frac{2}{3} in\ ascending\ order$:

Soln.

$\frac{1}{5}, \quad \frac{2}{3} \quad => \frac{3,\ \ 10}{15} \quad Ans: \frac{1}{5}, \frac{2}{3}$

Q7. Arrange $1½, \frac{3}{8}, \ \frac{2}{4} and\ 1\frac{3}{4}\ in\ the\ ascending\ order.$

Soln.

$1½, \frac{3}{8}, \quad \frac{2}{4}, \ 1\frac{3}{4} = \frac{3}{2}, \ \frac{3}{8}, \ \frac{2}{4}, \ \frac{7}{4}$

$\frac{12,3,4,14}{8} \quad Ans: \frac{3}{8}, \frac{2}{4}, 1\frac{1}{2}, 1\frac{3}{4}$

Arrangement in the descending order:

Q1. Arrange $\frac{3}{4} and \frac{1}{4} in\ the\ descending\ order.$

Soln

$\frac{3}{4} \ , \frac{1}{4} => \frac{3, \ 1}{4}, \quad Ans: \frac{3}{4}, \ \frac{1}{4}$

Q2. Arrange $\frac{1}{4}, \ \frac{3}{4} \ and \frac{2}{3}$ from the highest to the lowest.

Soln.

$\frac{1}{4}, \quad \frac{3}{4}, \ \frac{2}{3} => \frac{3, \ 9, \ 8}{12}$ Ans $: \frac{3}{4}, \quad \frac{2}{3}, \quad \frac{1}{4}$

Q3. Arrange the following fractions in the descending order:

a) $\frac{2}{6}, \quad \frac{4}{5}, \quad \frac{1}{6}, \quad \frac{7}{10}$

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

Soln.

a) $\frac{2}{6}, \frac{4}{5}, \frac{1}{6}, \frac{7}{10} => \frac{10, \ 24, \ 5, \ 21}{30}$

Ans: $\frac{4}{5}, \frac{7}{0}, \frac{2}{6}, \frac{1}{6}$

b) $1\frac{1}{3}, 1\frac{4}{6}, 1\frac{1}{2} \quad = \frac{4}{3}, \quad \frac{10}{6}, \quad \frac{3}{2}$

$\frac{8, \ 10, \ 9}{6} \quad Ans: 1\frac{4}{6}, 1\frac{1}{2}, 1\frac{1}{3}$

Q4. Arrange these given fractions from the highest to the lowest

a) $2\frac{1}{2},\ 2\frac{2}{7},\ 2\frac{1}{7}$

b) $\frac{7}{3},\ 2\frac{1}{5},\ \frac{8}{3},\ 2\frac{1}{6}$

Soln.

a) $2\frac{1}{2},\ 2\frac{2}{7},\ 2\frac{1}{7} = \frac{5}{2}, \frac{16}{7},\ \frac{15}{7}$

$\frac{35,\ \ 32,\ \ 30}{14}$ Ans: $2\frac{1}{2},\ 2\frac{2}{7}, 2\frac{1}{7}$

b) $\frac{7}{3},\ 2\frac{1}{5},\ \frac{8}{3},\ 2\frac{1}{6} = \frac{7}{3}, \frac{11}{5}, \frac{8}{3}, \frac{13}{6}$

$\frac{70,\ \ 66,\ \ 80,\ \ 65}{30}$ $Ans: \frac{8}{3}, \frac{7}{3}, 2\frac{1}{5}, 2\frac{1}{6}$

Story problems involving fractions:

Q1. A man spent $\frac{1}{4}$ of his pay on food and ½ of the same pay on drinks. If the amount spent amounted to ¢12, find his total pay.

Soln.

Fraction of pay spent on food = $\frac{1}{4}$.

Fraction of pay spent on drinks = $\frac{1}{2}$.

Total fraction which represents the amount spent = $\frac{1}{4} + \frac{1}{2} = \frac{1+2}{4} = \frac{3}{4}$.

But actual amount spent = ¢12.

But fraction representing the amount spent = the actual amount $\Rightarrow \frac{3}{4} = ¢12$.

N/B: The total pay is equal to 1 or represented by 1 and ¾ = 0.75.

$\therefore\ if\ \frac{3}{4} = ¢12$

$$=> \quad 1 = \frac{1}{\frac{3}{4}} \times 12 = \frac{1}{3} \times 4 \times 12 = 16$$

$$=> \quad total\ pay \ = ¢16$$

Q2. A man spent $\frac{1}{3}$ of his salary on rent and $\frac{1}{2}$ of the same salary on funeral. If the amount spent was ¢50, calculate his total salary.

Soln.

Fraction representing the amount spent on rent = $\frac{1}{3}$.

Fraction representing the amount spent on funeral = $\frac{1}{2}$,

$\therefore \ fraction\ representing\ the\ total\ amount\ spent = \frac{1}{3} + \frac{1}{2} \ = \ \frac{2+3}{6} = \frac{5}{6}$.

But the total amount spent =¢50.

But fraction representing the total amount spent = the actual amount spent. $=> \frac{5}{6} =$ ¢50.

But the total salary = 1$\therefore \ if \frac{5}{6} = ¢50 \ => 1 = \frac{\frac{1}{5}}{6} \times ¢50 = \frac{1}{5} \times 6 \times 50 = ¢60 =>$ $The\ total\ amount = ¢60$

N/B: 1- $\frac{2}{3} = \frac{1}{3}, \quad 1 - \frac{2}{5} = \frac{3}{5}$

- In the first case, consider the $\frac{2}{3}$, remove the 2 from the 3 to get 1 and put the 1 over the 3 to get $\frac{1}{3}$.
- In the second case, consider the $\frac{2}{5}$, remove the 2 from the 5 to get 3 and put this over the 5 to get $\frac{3}{5}$.
- Also $1 - \frac{3}{8} \ = \frac{5}{8}, ie$ remove the 3 from the 8 to get 5 and put this over the 8 to get $\frac{5}{8}$

Q3. A man spent $\frac{1}{4}$ of his money on rent and $\frac{1}{2}$ on sweets. If the amount left was ¢16, find the total amount.

Soln.

Fraction representing the amount spent on rent =1/4.

Fraction representing the amount spent on sweets = $\frac{1}{2}$.

Fraction representing the total amount spent

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

=> fraction representing the amount left = 1- $\frac{3}{4} = \frac{1}{4}$.

Amount left = ¢16.

But fraction representing the amount left = the amount left => $1/4 = ¢16$.

But total amount = 1.

$$\therefore \ if \ \frac{1}{4} = ¢16 \ \ then \ 1 = \frac{1}{\frac{1}{4}} \times 16 = \frac{1}{1} \times 4 \times 16 = ¢64$$

$$=> The \ total \ amount = ¢64.$$

Q4. Esi was given an amount of money. She spent $\frac{2}{3}$ on books and ¼ on dresses. If she still had ¢10, calculate this amount.

Soln.

Fraction representing the amount spent on books = $\frac{2}{3}$.

Fraction representing the amount spent on dresses = $\frac{1}{4}$.

Fraction representing the total amount spent = $\frac{2}{3}+\frac{1}{4}$

= $\frac{8+3}{12} = \frac{11}{12}$.

Fraction representing the amount left = 1- $\frac{11}{12} = \frac{1}{12}$. Amount left = ¢10

But fraction representing the amount left

= the amount left.

$$=> \frac{1}{12} = ¢10.$$

And the total amount = 1.

$\therefore if \frac{1}{12} = ¢10$

$$=> 1 = \frac{\frac{1}{1}}{12} \times 10 = \frac{1}{1} \times 12 \times 10 = ¢120$$

Q5. A man spent $\frac{1}{4}$ of his salary on drinks And 1/5 of the remainder on food. If the amount spent is ¢200, find his salary.

Soln.

First he spent ¼ of his salary on drinks.

= >the fraction representing the remainder

= 1- ¼ = ¾ .

He then spent $\frac{1}{5}$ of the remainder on food

=> fraction spent food = $\frac{1}{5}$ of the remainder

= $\frac{1}{5} \times \frac{3}{4} = \frac{3}{20}$.

Fraction representing the total amount spent = fraction representing the amount spent on drinks + fraction representing the amount spent on food.

= $\frac{1}{4} + \frac{3}{20} = \frac{5+3}{20} = \frac{8}{20}$.

But fraction representing the total amount spent = the amount spent $=> \frac{8}{20} = ¢200$

But his salary = 1.

$$\therefore \ if \ \frac{8}{20} = ¢200, then \ 1 = \frac{\frac{1}{8}}{20} \times 200$$

$$= \frac{1}{8} \times 20 \times 200 = ¢500, => \ his \ salary = ¢500.$$

Q6. A man spent ½ of his pocket money on entertainment and $\frac{1}{5} \ of$ the remainder on drinks. If the amount spent is ¢60, calculate his pocket money.

Soln.

Fraction of the amount spent on drinks = $\frac{1}{2}$ =>remainder = 1- ½ = ½.

The fraction of the amount spent on drinks
$= \frac{1}{5}$ of the remainder $= \frac{1}{5}\ of\ \frac{1}{2} = \frac{1}{5} \times \frac{1}{2} = \frac{1}{10}$.
Fraction representing the total amount spent or the amount spent = the fraction spent on entertainment + the fraction spent on drinks
$= \frac{1}{2} + \frac{1}{10} = \frac{5+1}{10} = \frac{6}{10} = \frac{3}{5}$.
Amount spent = ¢60.
But fraction representing the amount spent = the amount spent $=> \frac{3}{5} = 60$.
But his pocket money =1.

$$\therefore if\ \frac{3}{5} = ¢60\ then\ 1 = \frac{\frac{1}{3}}{5} \times 60$$

$$= \frac{1}{3} \times 5 \times 60 = ¢100$$

$$=> pocket\ money = ¢100$$

Q7. A man spent ¼ of his salary on food, and $\frac{1}{5}$ of the remainder on drinks. If the amount left was ¢50, find his salary.

Soln.

Fraction of salary spent on food = ¼.
Fraction representing the remainder = 1 – ¼ = ¾.
Fraction spent on drinks = $\frac{1}{5}$ of the remainder
$= \frac{1}{5}\ of\ \frac{3}{4} = \frac{1}{5} \times \frac{3}{4} = \frac{3}{20}$.
Fraction representing the amount spent on food + fraction representing the amount spent on drinks
$= \frac{1}{4} + \frac{3}{20} = \frac{5+3}{20} = \frac{8}{20} = \frac{2}{5}$.
Fraction representing the amount left = $1 - \frac{2}{5} = \frac{3}{5}$.
But since the amount left = ¢50 $=> \frac{3}{5} = ¢50, => 1 = 1/3 \times 5 \times 50 = 83, \therefore$
$his\ salary = ¢83$.
N/B: The man's salary is represented by 1

Q8. A man spent ¼ of his salary on rent, $\frac{2}{5}$ on food and $\frac{1}{6}$ on drinks. If the amount spent was ¢490, determine his total salary or salary.

Soln.

Fraction representing the amount spent on rent, food and drinks = $\frac{1}{4}+\frac{2}{5}+\frac{1}{6}=\frac{15+24+10}{60}=\frac{49}{60}$.

But amount spent = ¢490.

But fraction representing the amount spent = the amount spent $\Rightarrow \frac{49}{60}=¢490$

But his salary or total salary = 1

$\therefore \ if\ \frac{49}{60}=490\ then\ 1=\frac{1}{49}\times 60\times 490=¢600$

His salary = ¢600..

Q9. A man spent $\frac{1}{2}$ of his money on rent, $\frac{1}{5}$ on food and $\frac{1}{6}$ on books. If he still had ¢55,000 left, determine this amount.

Soln.

Fraction representing the amount spent on rent, food and books = $\frac{1}{2}+\frac{1}{5}+\frac{1}{6}=\frac{15+6+5}{30}=\frac{26}{30}=\frac{13}{15}$

$\therefore \ fraction\ representing\ the\ amount\ left=1-\frac{13}{15}=\frac{2}{15}$

But since the amount left = ¢55,000 $\Rightarrow \frac{2}{15}=¢55{,}000.$

But total amount = 1

$\therefore \ if\ \frac{2}{15}=¢55{,}000, \Rightarrow\ 1=\frac{1}{\frac{2}{15}}\times 55{,}000$

$=\frac{1}{2}\times 15\times 55{,}000=41250=¢41250.$

Q10. A man spent $\frac{1}{4}$ of his money on rent, $\frac{2}{5}$ on transport and the rest on entertainment. If the amount spent on entertainment was ¢77, calculate his total amount.

Soln.

Fraction representing the amount spent on rent and transport = $\frac{1}{4} + \frac{2}{5} = \frac{5+8}{20} = \frac{13}{20}$

The rest of the money = the remainder

= 1 - $\frac{13}{20} = \frac{7}{20}$,

$=> the\ fraction\ spent\ on\ entertainment = \frac{7}{20}$.

Also the amount spent on entertainment = ¢77

$=> \frac{7}{20} = ¢77$.

Total amount = 1.

$\therefore if\ \frac{7}{20} = ¢77\ then\ 1 = \frac{1}{\frac{7}{20}} \times 77$

$= \frac{1}{7} \times 77 \times 20 = ¢220$ (which is his total amount).

Q11. John spent $\frac{1}{2}$of his salary on food, $\frac{2}{5}$ on shoes and the rest on sweets. If he spent ¢18 on shoes, find his salary.

Soln.

Fraction of salary spent on shoes = $\frac{2}{5}$.

Amount spent on shoes = ¢18.

Fraction of salary spent on shoes = the amount spent on shoes $=> \frac{2}{5} = ¢18.$

But total salary = 1.

Now if $\frac{2}{5} = ¢18\ then\ 1 = \frac{\frac{1}{2}}{5} \times 18$

= $\frac{1}{2} \times 5 \times 18 = ¢45.$

His salary = ¢45.

Q12. Three children shared some oranges as follows: Akwasi got $\frac{1}{3}$ of the total and the remainder was shared between Abena and Jane in the ratio 3:2 respectively. If Jane got 24 oranges, how many did Akwasi get?

Soln.

Let y = the total number of oranges shared by the three children.

⇨ The number of oranges had by Akwasi =1/3 y.

⇨ The remainder =1-1/3 y = 2/3 y.

This was shared between Abena and Jane in the ratio 3:2 respectively.

Total ratio = 3+2 = 5.

Number of oranges shared = $\frac{2}{3}y$.

Jane's share = $\frac{2}{5}$ × total number of oranges shared = $\frac{2}{5} \times \frac{2}{3}y = \frac{4y}{15}$.

Since Jane got 24 oranges, $=> \frac{4y}{15} = 24 \ => 4y = 15 \times 24 => y = \frac{15 \times 24}{4} = 90$

Total number of oranges shared = y = 90. Akwasi's share

$= \frac{1}{3} \times 90 = 30\ oranges$.

Q13. In a certain school, one tenth of the pupils like maths and half of those who like maths are girls. If there are 240 pupils altogether, find the number of those who like maths.

Soln.

No of pupils = 240.

No of those who like maths = $\frac{1}{10} \times 240$

$= 24$ Students.

$=> 24$ Pupils like Maths. Since half of those who like maths are girls =>the number of girls who like maths

$= \frac{1}{2} \times 24 = 12\ girls$.

Q14. In a certain school half of the students like maths, and one quarter of those who like maths are girls. If there are 25 girls who like maths, how many students are there in the school?

Soln.

Let y = total number of students in the school.

$= >$ Number of those who like maths

$= \frac{1}{2} \times y = \frac{1}{2}y$. Since ¼ of those who like maths are girls, then the number of girls who like maths

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

But since the number of girls who like maths = 25 $=> \frac{y}{8} = 25, => y = 8 \times 25$

$=> y = 200 = total\ number\ of\ students$ in the school.

Q15. In a certain school, two third of the students are girls. If there are ten boys in the school, how many students are there within the school?

Soln.

Since $\frac{2}{3}$ $of\ the\ students\ are\ girls\ then$

the rest = $1 - \frac{2}{3} = \frac{1}{3}, => \frac{1}{3}\ are\ boys.$

But since there are 10 boys $=> \frac{1}{3} = 10.$

The number of students in the school is represented by 1 or is equal to 1.

$\therefore If\ \frac{1}{3} = 10\ then\ 1 = \frac{\frac{1}{1}}{3} \times 10 = 30.$

There are 30 students within the school.

Q16. In an examination $\frac{1}{5}$ of the candidates failed. If 20 candidates passed, how many students or candidates wrote the examination?

Soln.

Since $\frac{1}{5}$ of the candidates failed, then the rest

$= 1 - \frac{1}{5} = \frac{4}{5}\ passed$.

Since 20 candidates passed, $=> \frac{4}{5} = 20.$

But total number of candidates who wrote the exams is represented by 1.

$$\therefore If\ \frac{4}{5} = 20\ then\ 1 = \frac{\frac{1}{4}}{5} \times 20$$

$$= \frac{1}{4} \times 5 \times 20 = 25,$$

$$=> 25\ candidates\ wrote\ the\ exams.$$

Q17. One quarter of the number of students in a class were punished. If 25 students were punished, how many students are there in the class?

N/B: The total number of students in the class is represented by 1 or is equal to 1.

Soln.

Since one quarter of the students were punished and 25 students were punished, $=>\frac{1}{4}=25$.

Total number of students = 1.

If ¼ = 25, then 1 = $\frac{1}{\frac{1}{4}} \times 25 = \frac{1}{1} \times 4 \times 25 = 100\ students.$

*T*here are 100 students in the class.

Method 2

Let *x* = the number of students in the class.

Since one quarter of the number of students is 25

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

$=> \frac{x}{4} = 25 \ => x = 4 \times 25$

$=> x = 100.$

*T*here are 100 students in the class.

Q18. A farmer has 1 hectare of land. One half of the land was used for planting oranges, $\frac{1}{3}$ of the remainder was used for planting mangoes while plantain was planted on the rest.

(i) Express the area of land used for mangoes as a fraction of that used for planting plantain.

(ii)If a laborer was given a week to weed the orange plantation and he completed $\frac{1}{5}$ of it on the first day, what area in square metre was left?

Soln:

Total land area the farmer has = 1 hectare = 10,000cm^2.

Area of land used to cultivate orange = one half of the total land = $\frac{1}{2}$ x 10000

= 5,000m^2.

Remainder of land left = 10,000 – 5,000 = 5,000m^2.

Area of land used to cultivate mangoes = $\frac{1}{3}$ x 5000 = 1667m^2.

Area of land left = the rest = 5000 – 1667 = 3333m^2,

Area of land used for the planting of plantain = 3333m^2.

(ii)Area of land used for mango planting as a fraction of that used for planting plantain

= $\frac{Area\ used\ for\ mango\ planting}{Area\ used\ for\ plantin\ planting}$ x 100

= $\frac{1667}{3333}$ x 100 = 50%.

N/B: One half = $\frac{1}{2}$ and one and half = $1\frac{1}{2}$.

Q19. Amadu had 300 goats. He gave $\frac{1}{3}$ of them to John and $\frac{1}{6}$ to Kofi. He then gave $\frac{1}{5}$ of the remainder to his father and sold the rest at 3 goats for 10 cedis. Determine the total amount he had form this sale.

Soln:

Total number of goats = 300.

Number of goats given to John = $\frac{1}{3}$ x 300 = 100 goats.

Number of goats given to Kofi = $\frac{1}{6}$ x 300 = 50 goats.

Total number of goats given to John and Kofi = 100 + 50 = 150 goats.

Number of goats left or the remainder = 300 – 150 = 150 goats.

Since he gave $\frac{1}{5}$ of the remainder to his father, then the remainder of goats given to his father = $\frac{1}{5}$ x 150 = 30 goats.

The number of goats now left or the remainder = 150 – 30 = 120 goats.

These goats were sold at 3 goats for 10 cedis.

If 3 goats = 10 cedis,

then 120 goats = $\frac{120}{3}$ x 1o = 400 cedis.

Q20. Mr. Abukari had 16 tyres and he first gave $\frac{1}{4}$ of them to a friend. He then gave $\frac{1}{6}$ and $\frac{1}{3}$ of the remainder respectively to Ama and Esi. If he distributed the rest between his two sons Amin and Issa in the ratio 1 : 5 respectively, find the number of tyres had by each of them.

Soln:

Total number of tyres = 16 tyres.

Number of tyres given to the friend = $\frac{1}{4}$ x 16 = 4 tyres.

The remainder = 16 – 4 = 12 tyres.

Number of tyres given to Ama = $\frac{1}{6}$ of the remainder

= $\frac{1}{6}$ x 12 = 2 tyres.

Number of tyres given to Esi = $\frac{1}{3}$ x 12 = 4 tyres.

Total number of tyres given to Esi and Ama = 2 + 4 = 6 tyres.

Number of tyres left or the rest = 12 – 6 = 6 tyres.

These 6 tyres were distributed between his two sons:

	Amin	:	Issa
Ratio	1	:	5

Total ratio = 1 + 5 = 6

Amin`s share = $\frac{1}{6}$ x 6 = 1 tyre.

Issa`s share = $\frac{5}{6}$ x 6 = 5 tyres.

Q21. If two third of a man's monthly salary is equivalent to ¢180, determine

a) his whole monthly salary.
b) one sixth of his monthly salary.

Soln.

a) Let x = his monthly salary

   Since two third of his salary = ¢180 $=> \frac{2}{3}x = 180, => 2x = 3 \times 180, =>$

   $2x \ => 540,$

   $=> x = \frac{540}{2} = 270.$

   $His\ monthly\ salary = ¢270.$

b) One sixth of his monthly salary

   = $\frac{1}{6} \times 270 = ¢45.$

Q22. Given that one third of a certain number is equal to 18, determine

a) the number.
b) the value of twice the number.
c) the value of half the number.

Soln.

a) Let x = the number. Since one third of the number is equal to 18 $=>$

   $\frac{1}{3}x = 18$,

   $=> \frac{x}{3} = 18 => x = 18 \times 3 = 54, => the\ number = 54.$

b) Twice the number = 2 x 54 = 108.
c) Half the number = ½ x 54 = 27.

Q23) When half of a certain number is added to one third of the same number, our answer is equal to 4. Determine this number.

Soln.

Let x = the number

=>half the number = ½ x and one third the number = $\frac{1}{3}x$. Since if half the number when added to one third the number gives an answer of 4,$=> \frac{1}{2}x + \frac{1}{3}x = 4 => \frac{x}{2} + \frac{x}{3} = 4.$

Multiply through using 6 $=> 6 \times \frac{x}{2} + 6 \times \frac{x}{3} = 6 \times 4, => 3x + 2x = 24 => 5x = 24, => x = \frac{24}{5} => x = 4\frac{4}{5}$. The number = $4\frac{4}{5}$.

Q24. When two third of a certain number is added to one quarter of the same number, our result is 11. Find the number.

Soln.

If x = our number, then $\frac{2}{3}x + \frac{1}{4}x = 11.$

Multiply through using 12

$$=> 12 \times \frac{2}{3}x + 12 \times \frac{1}{4}x = 12 \times 11,$$

$$=> 8x + 3x = 132 \ => 11x = 132.$$

$$If\ 11x = 132 \ => x = \frac{132}{11} = 12.$$

Q25. When three fifth of a number is removed or subtracted from two third of that same number, our answer is 1. Determine this number.

Soln.

If x = the number, then $\frac{2}{3}x - \frac{3}{5}x = 1.$

Multiply through using 15 $=> 15 \times \frac{2}{3}x - 15 \times \frac{3x}{5} = 15 \times 1, => 10x - 9x = 15,$

$=> x = 15.$

$\therefore The\ number = 15.$

Questions

Q1. Solve the following fraction:

1. $\frac{1}{2}+\frac{1}{5}$ $Ans: \frac{7}{10}$
2. $\frac{2}{4}+\frac{1}{3}+\frac{1}{6}$ $Ans: 1$
3. $1\frac{1}{3}+\frac{1}{4}+\frac{1}{2}$ $Ans: 2\frac{1}{12}$
4. $\frac{3}{4}-\frac{2}{3}$ $Ans: \frac{1}{12}$
5. $\frac{3}{2}-\frac{1}{4}-\frac{2}{3}$ $Ans: \frac{7}{12}$
6. $\frac{1}{2}+\frac{3}{4}-\frac{2}{3}$ $Ans: \frac{7}{12}$
7. $\left(\frac{4}{5}\div\frac{3}{5}\right)+\frac{1}{2}\times\frac{2}{3}$ $Ans: 1\frac{2}{3}$
8. $\frac{1}{2}\ of\frac{1}{6}\times\frac{1}{3}+\frac{1}{12}$ $Ans: \frac{1}{9}$
9. $1\frac{1}{3}+\frac{1}{3}-\frac{3}{4}\div\frac{3}{2}$ $Ans: 1\frac{1}{6}$
10. $\left(\frac{1}{2}+\frac{3}{4}\right)\times\frac{2}{3}\div\left(\frac{6}{3}\times\frac{1}{6}\right)\ of\frac{3}{4}$ Ans: $3\frac{1}{3}$

Q2. Arrange the following fractions in ascending order.

a) $\frac{1}{3},\ \frac{2}{4},\ \frac{4}{5}$ $Ans: \frac{1}{3},\ \frac{2}{4},\ \frac{4}{5}$

b) $1\frac{2}{5},\ 1\frac{1}{5},\ 1\frac{3}{5}$ $Ans: 1\frac{1}{5}, 1\frac{2}{5},\ 1\frac{3}{5}$

c) $2\frac{1}{3},\ \frac{8}{3},\ 2\frac{1}{4},\ 2\frac{1}{2}$ $Ans: 2\frac{1}{4}, 2\frac{1}{3},\ 2\frac{1}{2}, \frac{8}{3}$

Q3. Arrange the following fractions in the descending order.

a) $\frac{3}{5}, \frac{2}{3}, \frac{2}{6}$ $Ans: \frac{2}{3}, \frac{3}{5}, \frac{2}{6}$

b) $1\frac{1}{3}, 1\frac{4}{5}, 1\frac{2}{3}$ $Ans: 1\frac{4}{5}, 1\frac{2}{3}, 1\frac{1}{3}$

c) $\frac{3}{7}, \frac{1}{5}$ $Ans: \frac{3}{7}, \frac{1}{5}$

d) $\frac{5}{4}, 1\frac{1}{3}, \frac{4}{6}$ $Ans: 1\frac{1}{3}, \frac{5}{4}, \frac{4}{6}$

Q4. A man spent $\frac{2}{3}$ of his salary on food and ¼ of the same salary on drinks. If the amount spent was ¢44, determine his salary. Ans: ¢48.

Q5. A girl spent ½ of her pocket money on books and $\frac{1}{8}$ of it on food. If ¢50 was the amount spent, determine her pocket money. Ans: ¢80.

Q6. John was given an amount of money by his father. He spent ¼ of it on entertainment and $\frac{1}{8}$ of it on food. If ¢80 was the amount left, how much did his father give him? Ans: ¢128

Q7. Musah Abanga was given an amount of money. He spent $\frac{2}{3}$ of it on games and later spent ¼ of it on friends. If he still had ¢20, how much was this amount?

Ans: ¢240

Q8. A man spent ½ of his salary on rent and $\frac{2}{5}$ of the remainder on his car. If the amount spent was ¢40, determine his salary. Ans: ¢57

Q9. Kojo spent ½ of his pocket money on books, $\frac{1}{12}$ of it on drinks and $\frac{1}{6}$ of it on entertainment. If the amount spent was ¢90, determine his pocket money.

. Ans: ¢120

Q10. Abu's father gave him an amount of money. He first spent $\frac{1}{3}$ of it on rent, ¼ of it on his car and $\frac{1}{6}$ of it on food. If he was left with ¢300, how much was given to him by his father? Ans: ¢1200

Q11. In a certain school, $\frac{1}{6}$ of the students are girls. If the number of boys in the school is 50, how many students are there in the school? Ans: 60 Students.

75

Q12. In a certain village, two third of the people are fair in colour and one quarter of the fair people are girls. If there are 10 fair girls in the village, how many people are there within the village? Ans: 60 people

Q13. Two third of a number when added to one third of the same number, gave us 6 as the answer. Find this number. Ans: 6

Q14. When one third of a number is removed from three quarters of the same number, our answer is 5. Find this number. Ans: 12

Q15. If half of a number is equal to 6, find three quarter of the number.

. .

Ans: 9.