CHAPTER FOUR.

FRACTIONS AND PYTHAGORAS THEOREM

(Q1) Simplify $\frac{2}{3}$ of $6\frac{3}{4} \div (2\frac{4}{15} - 1\frac{2}{3})$

N/B:

From Bodmas, we must solve what is inside the bracket first, then deal with the of and finally the division sign.

Soln:

$2\frac{4}{15} - 1\frac{2}{3} = \frac{34}{15} - \frac{5}{3}$

$\frac{34-25}{15} = \frac{9}{15} = \frac{3}{5}$, $\therefore \frac{2}{3}$ of $6\frac{3}{4} \div (2\frac{4}{15} - 1\frac{2}{3})$

$= \frac{2}{3}$ of $6\frac{3}{4} \div \frac{3}{5}$. Since $\frac{2}{3}$ of $6\frac{3}{4} = \frac{2}{3} \times \frac{27}{4} = \frac{9}{2}$, then $\frac{2}{3}$ of $6\frac{3}{4} \div \frac{3}{5}$

$= \frac{9}{2} \div \frac{3}{5} = \frac{9}{2} \text{x} \frac{5}{3} = \frac{15}{2} = 7\frac{1}{2}$

(Q2) Simplify $2\frac{3}{4} \div \left(3\frac{3}{8} - 1\frac{1}{12}\right)$.

Soln:

$3\frac{3}{8} - 1\frac{1}{12} = \frac{27}{8} - \frac{13}{12}$

$\frac{81-26}{24} = \frac{55}{24}$

$\therefore 2\frac{3}{4} \div \left(3\frac{3}{8} - 1\frac{1}{12}\right) = 2\frac{3}{4} \div \frac{55}{24}$

$2\frac{3}{4} \div \frac{55}{24} = \frac{11}{4} \div \frac{55}{24} = \frac{11}{4} \text{x} \frac{24}{55}$

$= \frac{6}{5} = 1\frac{1}{5}$.

(Q3) Simplify $(2\frac{1}{4} - 1\frac{5}{8}) \div 3\frac{7}{16}$

Soln:

$2\frac{1}{4} - 1\frac{5}{8} = \frac{9}{4} - \frac{13}{8}$

$\frac{18-13}{8} = \frac{5}{8}$

$\therefore \left(2\frac{1}{4} - 1\frac{5}{8}\right) \div 3\frac{7}{16} = \frac{5}{8} \div 3\frac{7}{16}.$

$\frac{5}{8} \div 3\frac{7}{16} = \frac{5}{8} \div \frac{55}{16} = \frac{5}{8} \text{x} \frac{16}{55} = \frac{2}{11}.$

(Q4) Simplify the fraction given next:

$(\frac{2}{15} + \frac{2}{5}) + (\frac{9}{10} \text{ x } \frac{4}{3}) + (\frac{1}{5} \div \frac{1}{4})$

N/B: Simplify what is in each bracket first.

(i) $\frac{2}{15} + \frac{2}{5}$

$\therefore \frac{2+6}{15} = \frac{8}{15}$

(ii) $\frac{9}{10} \text{ x } \frac{4}{3} = \frac{6}{5}$

(iii) $\frac{1}{5} \div \frac{1}{4} = \frac{1}{5} \text{ x } \frac{4}{1} = \frac{4}{5}.$

$\therefore (\frac{2}{15} + \frac{2}{5}) + \left(\frac{9}{10} \text{x } \frac{4}{3}\right) + (\frac{1}{5} \div \frac{1}{4})$

$= \frac{8}{15} + \frac{6}{5} + \frac{4}{5}$

$\frac{8+18+12}{15} = \frac{38}{15} = 2\frac{8}{15}.$

(Q5) A man spent $\frac{1}{4}$ of his monthly salary on rent, $\frac{2}{5}$ on food and $\frac{1}{6}$ *on books*. If he still had ¢55,000 left, what was his monthly salary?

Soln:

The fraction representing the amount spent on rent, food and books = $\frac{1}{4} + \frac{2}{5} + \frac{1}{6}$

$$\frac{15 + 24 + 10}{60} = \frac{49}{60}.$$

Fraction representing the amount left = 1- $\frac{49}{60} = \frac{11}{60}$.

Since the amount left = ₵55,000, then $\frac{11}{60}$ is equivalent to ₵55,000.

The total amount or his monthly salary is equivalent to 1.

Now if $\frac{11}{60} = 55{,}000$,

then 1 = $\frac{1}{\frac{11}{60}}$ x 55,000.

= $\frac{1}{11}$ x 60 x 55,000

= ₵300,000.

(Q6) (a) Simplify $6(3\frac{5}{6} - 1\frac{1}{4})$.

(b) Kojo had 1800 bags of rice in stock for sale. In January, he sold $\frac{2}{3}$ of it. In February, he sold $\frac{3}{4}$ *of what was left.*

(i) What fraction of the rice stock did he sell?

(a) in February?

(b) in January and February?

(ii) How many bags of rice were left unsold by the end of February?.

Soln:

(a) $3\frac{5}{6} - 1\frac{1}{4} = \frac{23}{6} - \frac{5}{4}$

$$\frac{46 - 15}{12} = \frac{31}{12} \therefore 6\left(3\frac{5}{6} - 1\frac{1}{4}\right) = 6 \text{ x } \frac{31}{12} = \frac{31}{2} = 15\frac{1}{2}.$$

(b) Number of bags of rice in stock = 1800 bags.

Number of rice bags sold in January = $\frac{2}{3}$ x $1800 = 1200$ bags.

Number of rice bags left unsold

i.e. what was left after this sale = 1800 – 1200 = 600 bags.

Since he sold $\frac{3}{4}$ of what was left in February, then the number of rice bags sold in February =

$\frac{3}{4}$ x 600 = 450 bags.

(i) Fraction of rice stock sold in February = $\frac{Number\ of\ bags\ sold\ in\ February}{The\ original\ number\ of\ bags\ of\ rice}$

$= \frac{450}{1800} = \frac{1}{4}$.

(ii)Total number of rice bags sold in January and February = 1200 + 450 = 1650bags.

The number of rice bags that was unsold at the end of February = the original number of rice bags – the number sold in January and February = 1800 – 1650.

= 150 bags.