

3. Simplify:

$$a) \frac{7}{12} + \frac{9}{12} - \frac{5}{12}$$

$$\text{Sol} = \frac{7+9-5}{12} = \frac{11}{12}$$

$$b) \frac{9}{10} - \frac{3}{5} + \frac{7}{8}$$

$$\text{Sol} = \frac{9}{10} + \frac{7}{8} - \frac{3}{5}$$

$$= \frac{9 \times 4 + 7 \times 5 - 3 \times 8}{40}$$

$$= \frac{36 + 35 - 24}{40} = \frac{71 - 24}{40} = \frac{47}{40} = 1 \frac{7}{40}$$

$$c) \frac{5}{12} - \frac{2}{3} - \frac{1}{2} + 7$$

$$\text{Sol} = \frac{5}{12} + 7 - \frac{2}{3} - \frac{1}{2}$$

$$= \frac{5 + 7 \times 12 - 2 \times 4 - 1 \times 6}{12} \quad [L.C.M. = 12]$$

$$= \frac{5 + 84 - 8 - 6}{12}$$

$$= \frac{89 - 14}{12} = \frac{75}{12} = 6 \frac{3}{12}$$

d) $\frac{1}{2} + \frac{3}{4} - \frac{5}{8} - \frac{1}{16}$

Sol = $\frac{8 + 3 \times 4 - 5 \times 2 - 1}{16} \quad [L.C.M. = 16]$

~~8 + 12~~ $= \frac{8 + 12 - 10 - 1}{16}$

$$= \frac{20 - 11}{16} = \frac{9}{16}$$

e) $8 \frac{3}{4} + 7 \frac{1}{2} - 3 \frac{1}{4} - 2 \frac{1}{2}$

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$$\begin{aligned}
 \text{Sol} &= \frac{35}{4} + \frac{15}{2} - \frac{13}{4} - \frac{5}{2} \\
 &= \frac{35 + 15 \times 2 - 13 - 5 \times 2}{4} \quad [\text{L.C.M.} = 4] \\
 &= \frac{35 + 30 - 13 - 10}{4} \\
 &= \frac{65 - 23}{4} = \frac{42}{4} = 10 \frac{2}{4}
 \end{aligned}$$

$$\text{b) } 10 \frac{5}{6} - 7 \frac{2}{3} + 8 \frac{1}{3} - 5 \frac{1}{2}$$

$$= \frac{10 \times 6 + 5}{6} - \frac{23}{3} + \frac{25}{3} - \frac{11}{2}$$

$$\begin{aligned}
 &= \frac{3 \mid 6, 3, 3, 2}{2 \mid 2, 1, 1, 2} \\
 &\quad 1, 1, 1, 1 \quad [\text{L.C.M.} = 6]
 \end{aligned}$$

$$= \frac{65 \times 1 - 23 \times 2 + 25 \times 2 - 11 \times 3}{6} = \frac{65 - 46 + 50 - 33}{6}$$

$$= \frac{65 - 46 + 50 - 33}{6} = \frac{36}{6} = \frac{6}{1} = 6$$

$$g) \ 5\frac{5}{12} - 6 + 8 - 5\frac{3}{5}$$

$$2 \overline{) 12,5}$$

$$3 \overline{) 6,5}$$

$$2 \overline{) 2,5}$$

$$5 \overline{) 1,5}$$

$$1,1$$

[L.C.M. 60]

$$\text{Sol} = \frac{65}{12} - \frac{6}{1} + \frac{8}{1} - \frac{28}{5}$$

$$= \frac{65 \times 5 - 6 \times 60 + 8 \times 60 - 28 \times 12}{60}$$

$$= \frac{325 - 360 + 480 - 326}{60} = \frac{805 - 686}{60}$$

$$= \frac{119}{60} = 1\frac{59}{60}$$

$$h) \ 10\frac{1}{4} + 6\frac{3}{8} - 15 + 1\frac{1}{2}$$

$$\text{Sol} = \frac{41}{4} + \frac{51}{8} - \frac{15}{1} + \frac{3}{2}$$

$$= \frac{41 \times 2 + 51 \times 1 - 15 \times 8 + 3 \times 4}{8}$$

$$= \frac{82 + 408 - 120 + 12}{8} = \frac{382}{8} = 10\frac{1}{4}$$

i) $25 - 20\frac{1}{2} + 15\frac{3}{5} - 5$

Sol = $\frac{25}{1} - \frac{41}{2} + \frac{75}{5} - \frac{5}{1}$

$$\begin{array}{r} 14 \\ 2 \overline{) 29} \\ \underline{2} \\ 09 \\ \underline{8} \\ 1 \end{array}$$

= $\frac{25 \times 10 - 41 \times 5 + 75 \times 2 - 5 \times 10}{10}$

= $\frac{250 - 205 + 150 - 50}{10} = \frac{400 - 255}{10}$

= $\frac{145}{10} = 14\frac{1}{2}$

j) $\frac{9}{14} - 1\frac{2}{7} + 4\frac{3}{7} - 1\frac{2}{21}$

$$\begin{array}{l} 7 \overline{) 14, 7, 7, 21} \\ \underline{2, 1, 1, 3} \end{array}$$

Sol = $\frac{9}{14} - \frac{9}{7} + \frac{31}{7} - \frac{23}{21}$

= $\frac{9 \times 3 - 9 \times 6 + 31 \times 6 - 23 \times 2}{42} = \frac{18 - 54 + 186 - 46}{42}$

= $\frac{106}{42} = 2\frac{11}{21}$

$$\begin{array}{r} 2 \\ 21 \overline{) 53} \\ \underline{42} \\ 11 \end{array}$$