RD SHARMA

Solutions

Class 8 Maths

Chapter 1

Ex *1.4*

Q-1. Simplify each of the following and write as a rational number of the form $\frac{p}{q}$:

(i) $\frac{3}{4}+\frac{5}{6}+\frac{-7}{8}$

(ii) $\frac{2}{3}+\frac{-5}{6}+\frac{-7}{9}$

(iii) $\frac{-11}{2}+\frac{7}{6}+\frac{-5}{8}$

(iv) $\frac{-4}{5}+\frac{-7}{10}+\frac{-8}{15}$

(v) $\frac{-9}{10}+\frac{22}{15}+\frac{13}{-20}$

(vi) $\frac{5}{3}+\frac{3}{-2}+\frac{-7}{3}+3$

Solution:

(i) $\frac{3}{4}+\frac{5}{6}+\frac{-7}{8}$

$=\frac{3}{4}+\frac{5}{6}-\frac{7}{8}$

$=\frac{3\times6}{4\times6}+\frac{5\times4}{6\times4}-\frac{7\times3}{8\times3}$

$=\frac{18}{24}+\frac{20}{24}-\frac{21}{20}$

$=\frac{18+20-21}{24}$

$=\frac{17}{24}$

(ii) $\frac{2}{3}+\frac{-5}{6}+\frac{-7}{9}$

$=\frac{2}{3}+\frac{-5}{6}-\frac{7}{9}$

$=\frac{2\times6}{3\times6}-\frac{5\times3}{6\times3}-\frac{7\times2}{9\times2}$

$=\frac{12}{18}-\frac{15}{18}-\frac{14}{18}$

$=\frac{12-15-14}{18}=\frac{-17}{18}$

(iii) $\frac{-11}{2}+\frac{7}{6}+\frac{-5}{8}$

$=\frac{-11}{2}+\frac{7}{6}-\frac{5}{8}$

$=\frac{-11\times12}{2\times12}+\frac{7\times4}{6\times4}-\frac{5\times3}{8\times3}$

$=\frac{-132}{24}+\frac{28}{24}-\frac{15}{24}$

$=\frac{-132+28-15}{24}=\frac{-119}{24}$

(iv) $\frac{-4}{5}+\frac{-7}{10}+\frac{-8}{15}$

$=\frac{-4}{5}-\frac{7}{10}-\frac{8}{15}$

$=\frac{-4\times6}{5\times6}-\frac{7\times3}{10\times3}-\frac{8\times2}{15\times2}$

$=\frac{-24}{30}-\frac{21}{20}-\frac{16}{30}$

$=\frac{-24-21-16}{30}=\frac{-61}{30}$

(v) $\frac{-9}{10}+\frac{22}{15}+\frac{13}{-20}$

$= \frac{-9}{10} + \frac{22}{15} - \frac{13}{20}$

$= \frac{-9\times6}{10\times6} + \frac{22\times4}{15\times4} - \frac{13\times3}{20\times3}$

$= \frac{-54}{60} + \frac{88}{60} - \frac{39}{60}$

$= \frac{-54+88-39}{60} = \frac{-5}{60} = \frac{-1}{60}$

(vi) $\frac{5}{3} + \frac{3}{-2} + \frac{-7}{3} + 3$

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

$= \frac{5\times2}{3\times2} - \frac{3\times3}{2\times3} - \frac{7\times2}{3\times2} + \frac{3\times6}{1\times6}$

$= \frac{10}{6} - \frac{9}{6} - \frac{21}{6} + \frac{9}{3}$

$= \frac{10-9-14+18}{6} = \frac{5}{6}$

Q-2. Express each of the following as a rational number of the form $\frac{p}{q}$:

(i) $\frac{-8}{3} + \frac{-1}{4} + \frac{-11}{6} + \frac{3}{8} - 3$

(ii) $\frac{6}{7} + 1 + \frac{-7}{9} + \frac{19}{21} + \frac{-12}{7}$

(iii) $\frac{15}{2} + \frac{9}{8} + \frac{-11}{3} + 6 + \frac{-7}{6}$

(iv) $\frac{-7}{4} + 0 + \frac{-9}{5} + \frac{19}{10} + \frac{11}{14}$

(v) $\frac{-7}{4} + \frac{5}{3} + \frac{-1}{2} + \frac{-5}{6} + 2$

Solution:

(i) $\frac{-8}{3} + \frac{-1}{4} + \frac{-11}{6} + \frac{3}{8} - 3$

$= \frac{-8}{3} - \frac{1}{4} - \frac{11}{6} + \frac{3}{8} - \frac{3}{1}$

$= (\frac{-8}{3} - \frac{11}{6}) - (\frac{1}{4} - \frac{3}{8}) - \frac{3}{1}$

$= (\frac{-8\times2}{3\times2} - \frac{11}{6}) - (\frac{1\times2}{4\times2} - \frac{3}{8}) - \frac{3}{1}$

$= (\frac{-16}{6} - \frac{11}{6}) - (\frac{2}{8} - \frac{3}{8}) - \frac{3}{1}$

$= \frac{-27}{6} - \frac{-1}{8} - \frac{3}{1}$

$= \frac{-27\times4}{6\times4} - \frac{-1\times3}{8\times3} - \frac{3\times24}{1\times24}$

$= \frac{-108}{24} + \frac{3}{24} - \frac{72}{24}$

$= \frac{-108+3-72}{24}$

$= \frac{-177}{24} = \frac{-59}{8}$

(ii) $\frac{6}{7} + 1 + \frac{-7}{9} + \frac{19}{21} + \frac{-12}{7}$

$= \frac{6}{7} + \frac{1}{1} - \frac{7}{9} + \frac{19}{21} - \frac{12}{7}$

$= (\frac{6}{7} + \frac{19}{21} - \frac{12}{7}) + \frac{1}{1} - \frac{7}{9}$

$= (\frac{6\times3}{7\times3} + \frac{19}{21} - \frac{12\times3}{7\times3}) + \frac{1}{1} - \frac{7}{9}$

$= \left(\frac{18}{21} + \frac{19}{21} - \frac{36}{21}\right) + \frac{1}{1} - \frac{7}{9}$

$= \left(\frac{18+19-36}{21}\right) + \frac{1}{1} - \frac{7}{9}$

$= \frac{1}{21} + \frac{1}{1} - \frac{7}{9}$

$= \frac{1\times3}{21\times3} + \frac{1\times63}{1\times63} - \frac{7\times7}{9\times7}$

$= \frac{3}{63} + \frac{63}{63} - \frac{49}{63}$

$= \frac{3+63-49}{63} = \frac{17}{63}$

(iii) $\frac{15}{2} + \frac{9}{8} + \frac{-11}{3} + 6 + \frac{-7}{6}$

$= \frac{15}{2} + \frac{9}{8} - \frac{11}{3} + \frac{6}{1} - \frac{7}{6}$

$= \left(\frac{15}{2} + \frac{9}{8}\right) - \left(\frac{11}{3} + \frac{7}{6}\right) + \frac{6}{1}$

$= \left(\frac{15\times4}{2\times4} + \frac{9}{8}\right) - \left(\frac{11\times2}{3\times2} + \frac{7}{6}\right) + \frac{6}{1}$

$= \left(\frac{60}{8} + \frac{9}{8}\right) - \left(\frac{22}{6} + \frac{7}{6}\right) + \frac{6}{1}$

$= \frac{60+9}{8} - \frac{22+7}{6} + \frac{6}{1}$

$= \frac{69}{8} - \frac{29}{6} + \frac{6}{1}$

$= \frac{69\times3}{8\times3} - \frac{29\times4}{6\times4} + \frac{6\times24}{1\times24}$

$= \frac{207}{24} - \frac{116}{24} + \frac{144}{24}$

$= \frac{207-116+144}{24} = \frac{235}{24}$

(iv) $\frac{-7}{4} + 0 + \frac{-9}{5} + \frac{19}{10} + \frac{11}{14}$

$= \frac{-7}{4} - \frac{9}{5} + \frac{19}{10} + \frac{11}{14}$

$= \frac{-7}{4} + \frac{11}{14} - \left(\frac{9}{5} + \frac{19}{10}\right)$

$= \left(\frac{-7}{4} + \frac{11}{14}\right) - \left(\frac{9\times2}{5\times2} + \frac{19}{10}\right)$

$= \frac{-7}{4} + \frac{11}{14} - \left(\frac{18}{10} + \frac{19}{10}\right)$

$= \frac{-7}{4} + \frac{11}{14} - \frac{18+19}{10}$

$= \frac{-7}{4} + \frac{11}{14} - \frac{37}{10}$

$= \frac{-7\times35}{4\times35} + \frac{11\times10}{14\times10} - \frac{37\times14}{10\times14}$

$= \frac{245}{140} + \frac{110}{140} - \frac{518}{140}$

$= \frac{245+110-518}{140} = \frac{-121}{24}$

(v) $\frac{-7}{4} + \frac{5}{3} + \frac{-1}{2} + \frac{-5}{6} + 2$

$= \frac{-7}{4} + \frac{5}{3} - \frac{1}{2} - \frac{5}{6} + \frac{2}{1}$

$= \left(\frac{-7}{4} - \frac{1}{2}\right) + \left(\frac{5}{3} - \frac{5}{6}\right) + \frac{2}{1}$

$= \left(\frac{-7}{4} - \frac{1\times2}{2\times2}\right) + \left(\frac{5\times2}{3\times2} - \frac{5}{6}\right) + \frac{2}{1}$

$= \left(\frac{-7}{4} - \frac{2}{4}\right) + \left(\frac{10}{6} - \frac{5}{6}\right) + \frac{2}{1}$

$= \frac{-7-2}{4} + \frac{10-5}{6} + \frac{2}{1}$

$= \frac{-9}{4} + \frac{5}{6} + \frac{2}{1}$

$= \frac{-9\times3}{4\times3} + \frac{5\times2}{6\times2} + \frac{2\times12}{1\times12}$

$= \frac{-27}{12} + \frac{10}{12} + \frac{24}{12}$

$= \frac{-27+10+24}{12} = \frac{7}{12}$

Q-3. Simplify:

(i) $\frac{-3}{2} + \frac{5}{4} - \frac{7}{4}$

(ii) $\frac{5}{3} - \frac{7}{6} + \frac{-2}{3}$

(iii) $\frac{5}{4} - \frac{7}{6} - \frac{-2}{3}$

(iv) $\frac{-2}{5} - \frac{-3}{10} - \frac{-4}{7}$

(v) $\frac{5}{6} + \frac{-2}{5} - \frac{-2}{15}$

(vi) $\frac{3}{8} - \frac{-2}{9} + \frac{-5}{36}$

Solution:

(i) $\frac{-3}{2} + \frac{5}{4} - \frac{7}{4}$

Taking the LCM of the denominators:

$\frac{-3\times2}{2\times2} + \frac{5}{4} - \frac{7}{4}$
$= \frac{-6}{4} + \frac{5}{4} - \frac{7}{4}$

$= \frac{-6+5-7}{4}$

$= \frac{-8}{4} = -2$

(ii) $\frac{5}{3} - \frac{7}{6} + \frac{-2}{3}$

Taking the LCM of the denominators:

$\frac{5\times2}{3\times2} - \frac{7}{6} + \frac{-2\times2}{3\times2}$
$= \frac{10}{6} - \frac{7}{6} - \frac{4}{6}$

$= \frac{10-7-4}{6} = \frac{-1}{6}$

(iii) $\frac{5}{4} - \frac{7}{6} - \frac{-2}{3}$

Taking the LCM of the denominators:

$\frac{5\times3}{4\times3} - \frac{7\times2}{6\times2} + \frac{2\times4}{3\times4}$
$= \frac{15}{12} - \frac{14}{12} + \frac{8}{12}$

$= \frac{15-14-8}{12} = \frac{-5}{12}$

(iv) $\frac{-2}{5} - \frac{-3}{10} - \frac{-4}{7}$

Taking the LCM of the denominators:

$$\frac{-2\times14}{5\times14} + \frac{3\times7}{10\times7} + \frac{4\times10}{7\times10}$$
$$= \frac{-28}{70} + \frac{21}{70} + \frac{40}{70}$$
$$= \frac{-28+21+40}{70} = \frac{33}{70}$$

(v) $\frac{5}{6} + \frac{-2}{5} - \frac{-2}{15}$

Taking the LCM of the denominators:

$$\frac{5\times5}{6\times5} - \frac{2\times6}{5\times6} + \frac{2\times2}{15\times2}$$
$$= \frac{25}{30} - \frac{12}{30} + \frac{4}{30}$$
$$= \frac{25-12+4}{30} = \frac{17}{30}$$

(vi) $\frac{3}{8} - \frac{-2}{9} + \frac{-5}{36}$

Taking the LCM of the denominators:

$$\frac{3\times9}{8\times9} + \frac{2\times8}{9\times6} - \frac{5\times2}{36\times2}$$
$$= \frac{27}{72} + \frac{16}{72} - \frac{10}{72}$$
$$= \frac{27+16-10}{72}$$
$$= \frac{33}{72} = \frac{11}{24}$$