RD Sharma Solutions

Class 7

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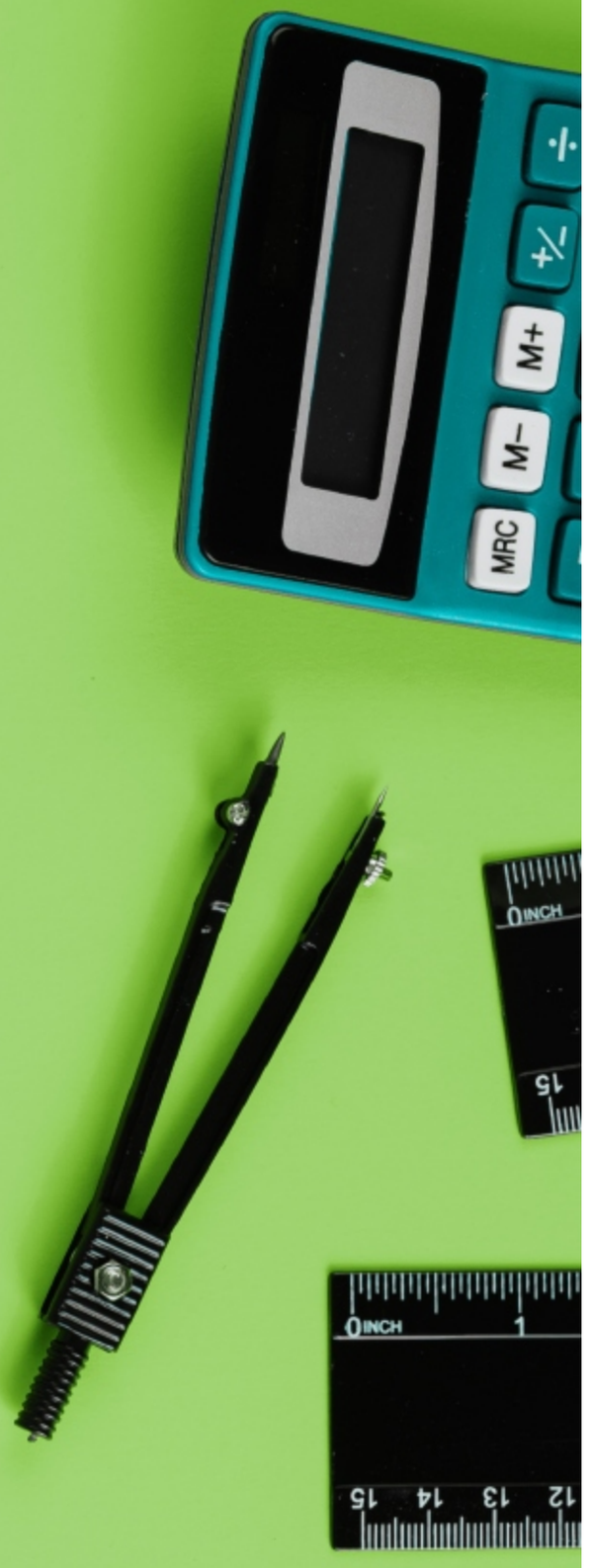

Chapter-2 - Fractions

Exercise 2.1

1. Compare the following fractions by using the symbol > or < or =

(i) $\frac{7}{9}$ and $\frac{8}{13}$ (ii) $\frac{11}{9}$ and $\frac{5}{9}$ (iii) $\frac{37}{41}$ and $\frac{19}{30}$

(iv) $\frac{17}{15}$ and $\frac{119}{105}$

Solution (i) $\frac{7}{9}$ and $\frac{8}{13}$

By Cross Multiplication

$7 \times 13 > 8 \times 9$

$91 > 72$

$\therefore \frac{7}{9} > \frac{8}{13}$

(ii) $\frac{11}{9}$ and $\frac{5}{9}$

here, $11 > 5$, Therefore $\frac{11}{9} > \frac{5}{9}$

(iii) $\frac{37}{41}$ and $\frac{19}{30}$

By cross multiplication

$37 \times 30 \quad 19 \times 41$

$= 1110 > 779$

$\therefore 37/41 > 19/30$

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(iv) $\frac{17}{15}$ and $\frac{119}{105}$

here, By Cross multiplication.

$17 \times 105 = 15 \times 119$

$\therefore \frac{17}{15} = \frac{119}{105}$

Q2 Arrange the following fractions in ascending order.

(i) $\frac{3}{8}, \frac{5}{6}, \frac{6}{8}, \frac{2}{4}, \frac{1}{3}$ (ii) $\frac{4}{6}, \frac{3}{8}, \frac{6}{12}, \frac{5}{16}$

Solution (i) $\frac{3}{8}, \frac{5}{6}, \frac{6}{8}, \frac{2}{4}, \frac{1}{3}$

LCM $(8, 6, 8, 4, 3) = 24$, therefore By making same denominator, we have.

$\frac{3}{8} \times \frac{3}{3} = \frac{9}{24}$; $\frac{5}{6} \times \frac{4}{4} = \frac{20}{24}$; $\frac{6}{8} \times \frac{3}{3} = \frac{18}{24}$

$\frac{2}{4} \times \frac{6}{6} = \frac{12}{24}$; $\frac{1}{3} \times \frac{8}{8} = \frac{8}{24}$

$\because$ By Comparing numerators, we have

$8 < 9 < 12 < 18 < 20$

$\Rightarrow \frac{1}{3} < \frac{3}{8} < \frac{2}{4} < \frac{6}{8} < \frac{5}{6}$

(ii) $\frac{4}{6}, \frac{3}{8}, \frac{6}{12}, \frac{5}{16}$

$\because$ LCM $(6, 8, 12, 16) = 48$, therefore by making same denominator, we have

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$\frac{4}{6} \times \frac{8}{8} = \frac{32}{48}$; $\frac{3}{8} \times \frac{6}{6} = \frac{18}{48}$

$\frac{6}{12} \times \frac{4}{4} = \frac{24}{48}$; $\frac{5}{16} \times \frac{3}{3} = \frac{15}{48}$

$\because \quad 15 < 18 < 24 < 32$

$\Rightarrow \frac{5}{16} < \frac{3}{8} < \frac{6}{12} < \frac{4}{6}$

Q.3 Arrange in following fractions in descending order.

(i) $\frac{4}{5}, \frac{7}{10}, \frac{11}{15}, \frac{17}{20}$ (ii) $\frac{2}{7}, \frac{11}{35}, \frac{9}{14}, \frac{13}{28}$

Solution: (i) $\frac{4}{5}, \frac{7}{10}, \frac{11}{15}, \frac{17}{20}$

LCM $(5, 10, 15, 20) = 60$

By Making same denominator equal to 60, we have

$\frac{4}{5} \times \frac{12}{12} = \frac{48}{60}$; $\frac{7}{10} \times \frac{6}{6} = \frac{42}{60}$; $\frac{11}{15} \times \frac{4}{4} = \frac{44}{60}$

$\frac{17}{20} \times \frac{3}{3} = \frac{51}{60}$

$\because \quad 51 < 48 < 44 < 42$

$\therefore$ descending order is $\frac{17}{20} > \frac{4}{5} > \frac{11}{15} > \frac{7}{10}$

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(ii) $\frac{4}{6}, \frac{3}{8}, \frac{6}{12}, \frac{5}{16}$

$\because$ LCM $(6, 8, 12, 16) = 48$

By making same denominator equals to 48, we have

$\frac{4}{6} \times \frac{8}{8} = \frac{32}{48}$; $\frac{3}{8} \times \frac{6}{6} = \frac{18}{48}$; $\frac{6}{12} \times \frac{4}{4} = \frac{24}{48}$

$\frac{5}{16} \times \frac{3}{3} = \frac{15}{48}$

$\because$ $32 > 24 > 18 > 15$

$\Rightarrow$ $\frac{4}{6} > \frac{6}{12} > \frac{3}{8} > \frac{5}{16}$

Q.4 Write five equivalent fractions of $\frac{3}{5}$.

Solution:

Five equivalent fraction to $\frac{3}{5}$ are.

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

$\Rightarrow \frac{6}{10}, \frac{9}{15}, \frac{12}{20}, \frac{15}{25}, \frac{18}{30}$

Q5 Find the sum

(i) $\frac{5}{8} + \frac{3}{10}$ (ii) $4\frac{3}{4} + 9\frac{2}{5}$ (iii) $\frac{5}{6} + 3 + \frac{3}{4}$

(iv) $2\frac{3}{5} + 4\frac{7}{10} + 2\frac{4}{15}$

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Solution (i) $\frac{5}{8}+\frac{3}{10}$

$$\frac{5\times5}{8\times5}+\frac{3\times4}{10\times4} \qquad \because \text{LCM of 8 and 10 is 40}$$

$$=\frac{25}{40}+\frac{12}{40}=\frac{25+12}{40}=\frac{37}{40}$$

(ii) $4\frac{3}{4}+9\frac{2}{5}$

$$=\frac{19}{4}+\frac{47}{5}$$

$$=\frac{19\times5}{4\times5}+\frac{47\times4}{5\times4} \qquad (\because \text{LCM}(4,5)=20)$$

$$=\frac{95}{20}+\frac{188}{20}=\frac{95+188}{20}=\frac{283}{20}$$

(iii) $\frac{5}{6}+\frac{3}{1}+\frac{3}{4}$

$$=\frac{5\times2}{6\times2}+\frac{3\times12}{1\times12}+\frac{3\times3}{4\times3} \qquad (\because \text{LCM}(6,1,4)=12)$$

$$=\frac{10}{12}+\frac{36}{12}+\frac{9}{12}$$

$$=\frac{10+36+9}{12}=\frac{55}{12}$$

(iv) $2\frac{3}{5}+4\frac{7}{10}+2\frac{4}{15}=\frac{13}{5}+\frac{47}{10}+\frac{34}{15}$

$$=\frac{13\times6}{5\times6}+\frac{47\times3}{10\times3}+\frac{34\times2}{15\times2} \qquad \because \text{LCM}(5,10,15)=30$$

$$=\frac{78}{30}+\frac{141}{30}+\frac{68}{30}=\frac{78+141+68}{30}=\frac{287}{30}$$

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Q6 Find the difference of

(i) $\frac{13}{24}$ and $\frac{7}{16}$ (ii) 6 and $\frac{23}{3}$ (iii) $\frac{21}{25}$ and $\frac{18}{20}$

(iv) $3\frac{3}{10}$ and $2\frac{7}{15}$

Solution: (i) $\frac{13}{24} - \frac{7}{16}$

$$LCM\ (24, 16) = 96$$

$$\Rightarrow \frac{13 \times 4}{24 \times 4} - \frac{7 \times 6}{16 \times 6}$$

$$= \frac{52}{96} - \frac{42}{96} = \frac{52-42}{96} = \frac{10}{96}$$

(ii) $6 - \frac{23}{3} = \frac{(6 \times 3) - 23}{3} = \frac{18-23}{3} = \frac{-5}{3}$

(iii) $\frac{21}{25} - \frac{18}{20}$

$$= \frac{(21 \times 4) - (18 \times 5)}{100} = \frac{84-90}{100} = \frac{-6}{100} = \frac{-3}{50}$$

(iv) $3\frac{3}{10} - 2\frac{7}{15}$

$$= \frac{33}{10} - \frac{37}{15} = \frac{(33 \times 6) - (37 \times 4)}{60} = \frac{198-148}{60} = \frac{50}{60} = \frac{5}{6}$$

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Q7 Find the difference:

(i) $\frac{6}{7} - \frac{9}{11}$ (ii) $8 - \frac{5}{9}$ (iii) $9 - 5\frac{2}{3}$

(iv) $4\frac{3}{10} - 1\frac{2}{15}$

Solution: (i) $\frac{6}{7} - \frac{9}{11}$

$$= \frac{(6\times11)-(9\times7)}{77} = \frac{66-63}{77} = \frac{3}{77}$$

(ii) $8 - \frac{5}{9} = \frac{(8\times9)-5}{9} = \frac{72-5}{9} = \frac{67}{9}$

(iii) $9 - 5\frac{2}{3}$

$$= 9 - \frac{17}{3} = \frac{(9\times3)-17}{3} = \frac{27-17}{3} = \frac{10}{3}$$

(iv) $4\frac{3}{10} - 1\frac{2}{15} = \frac{43}{10} - \frac{17}{15} = \frac{(43\times6)-(17\times4)}{60}$

$$= \frac{258-68}{60} = \frac{190}{60} = \frac{19}{6}$$

Q.8 Simplify

(i) $\frac{2}{3} + \frac{1}{6} - \frac{2}{9} = \frac{(2\times6)+(1\times3)-(2\times2)}{18} = \frac{12+3-4}{18}$

$$= \frac{15-4}{18} = \frac{11}{18}$$

(ii) $12 - 3\frac{1}{2} = 12 - \frac{7}{2} = \frac{24-7}{2} = \frac{17}{2}$

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(iii) $7\frac{5}{6} - 4\frac{3}{8} + 2\frac{7}{12}$

$$= \frac{47}{6} - \frac{35}{8} + \frac{31}{12} = \frac{(47\times4)-(35\times3)+(31\times2)}{24}$$

$$= \frac{188-105+62}{24} = \frac{145}{24}$$

Q.9 What should be added to $5\frac{3}{7}$ to get 12?

Solution: required no. $= 12 - 5\frac{3}{7} = 12 - \frac{38}{7}$

$$= \frac{12\times7-38}{7} = \frac{84-38}{7}$$

$$= \frac{46}{7} = 6\frac{4}{7}$$

Q.10 What should be added to $5\frac{4}{15}$ to get $12\frac{3}{5}$?

Solution: required no. $= 12\frac{3}{5} - 5\frac{4}{15}$

$$= \frac{63}{5} - \frac{79}{15} = \frac{(63\times3)-79}{15}$$

$$= \frac{189-79}{15} = \frac{110}{15}$$

$$= \frac{22}{3}$$

Q.11 Suman studies for $5\frac{2}{3}$ hours daily. She devotes $2\frac{4}{5}$ hours of her time for science and mathematics. How much time does she devote for other subjects?

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Solution: Total time given for study $= 5\frac{2}{3}$ hours

$= \frac{17}{3}$ hours.

Time given for science and Maths $= 2\frac{4}{5}$ hrs

$= \frac{14}{5}$ hr.

$\therefore$ Time given for other subjects

$$= \frac{17}{3} - \frac{14}{5} = \frac{(17\times5)-(14\times3)}{15}$$

$$= \frac{85-42}{15} = \frac{43}{15}$$

$$= 2\frac{13}{15} \text{ hrs.}$$

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12 A piece of wire is of length $12\frac{3}{4}$ m. If it is cut into two pieces in such a way that the length of one piece is $5\frac{1}{4}$ m. what is length of the other piece?

Solution: Total length of wire $= 12\frac{3}{4}$ m $= \frac{51}{4}$ m

length of one piece $= 5\frac{1}{4}$ m $= \frac{21}{4}$ m.

$\therefore$ length of other piece $= \frac{51}{4} - \frac{21}{4} = \frac{51-21}{4} = \frac{30}{4}$

$= \frac{15}{2} = 7\frac{1}{2}$ m.

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13. A rectangular sheet of paper is $12\frac{1}{2}$ cm long and $10\frac{2}{3}$ cm wide. Find its perimeter.

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Solution: length of sheet $= 12\frac{1}{2}$ cm $= \frac{25}{2}$ m

breadth $= 10\frac{2}{3}$ cm $= \frac{32}{3}$ cm.

Perimeter $= 2(l+b)$

$$= 2\left(\frac{25}{2}+\frac{32}{3}\right) = 2\left(\frac{25\times 6+32\times 4}{12}\right)$$

$$= 2\left(\frac{150+128}{12}\right)$$

$$= \frac{278}{6} = \frac{139}{3} = 46\frac{1}{3} \text{ cm}$$

Q14 In a 'magic square' the sum of the numbers in each row, in each column and along the diagonal is the same. Is this a magic square.

$\frac{4}{11}$	$\frac{9}{11}$	$\frac{2}{11}$
$\frac{3}{11}$	$\frac{5}{11}$	$\frac{7}{11}$
$\frac{8}{11}$	$\frac{1}{11}$	$\frac{6}{11}$

Solution: Sum of first row $= \frac{4}{11}+\frac{9}{11}+\frac{2}{11}$

$$= \frac{4+9+2}{11} = \frac{15}{11}$$

Sum of second row $= \frac{3}{11}+\frac{5}{11}+\frac{7}{11} = \frac{3+5+7}{11} = \frac{15}{11}$

Sum of third row $= \frac{8}{11}+\frac{1}{11}+\frac{6}{11} = \frac{8+1+6}{11} = \frac{15}{11}$

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Sum of First column $= \frac{4}{11} + \frac{3}{11} + \frac{8}{11} = \frac{15}{11}$

Sum of second column $= \frac{9}{11} + \frac{5}{11} + \frac{1}{11} = \frac{9+5+1}{11} = \frac{15}{11}$

Sum of third column $= \frac{2}{11} + \frac{7}{11} + \frac{6}{11} = \frac{2+7+6}{11} = \frac{15}{11}$

Sum of first Diagonal $= \frac{4}{11} + \frac{5}{11} + \frac{6}{11} = \frac{4+5+6}{11} = \frac{15}{11}$

Sum of second diagonal $= \frac{2}{11} + \frac{5}{11} + \frac{8}{11} = \frac{2+5+8}{11}$

$= \frac{15}{11}$

$\therefore$ Yes, it is a magic square.

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15 The cost of mathematics book is Rs $25\frac{3}{4}$ and that of science book is Rs. $20\frac{1}{2}$. Which costs more and by how much?

Solution Cost of maths book $= 25\frac{3}{4} = \frac{103}{4}$ Rupees

Cost of science book $=$ Rs. $20\frac{1}{2} = \frac{41}{2}$ Rupees.

$\because \frac{41}{2} = \frac{82}{4}$

$\therefore$ Cost of maths book is greater by

$\frac{103}{4} - \frac{82}{4} = \frac{103-82}{4} =$ Rs. $\frac{21}{4} = 5\frac{1}{4}$

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16 (i) Provide the number in box □ and also give its simplest form in each of the following

(i) $\frac{2}{3} \times \square = \frac{10}{30}$ (ii) $\frac{3}{5} \times \square = \frac{24}{75}$

Solution (i) $\frac{2}{3} \times \square = \frac{10}{30}$

$$\Rightarrow \square = \frac{10}{30} \times \frac{3}{2} = \frac{30}{60} = \frac{1}{2}$$

(ii) $\frac{3}{5} \times \square = \frac{24}{75}$

$$\Rightarrow \square = \frac{24}{75} \times \frac{5}{3} = \frac{8}{15}$$

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