

Board – CBSE

Class – 7th

Topic – Fractions and Decimals 2.1

Q.1 Solve:

(i) $2 - \frac{3}{5}$ (ii) $4 + \frac{7}{8}$ (iii) $\frac{3}{5} + \frac{2}{7}$ (iv) $\frac{9}{11} - \frac{4}{15}$

(v) $\frac{7}{10} + \frac{2}{5} + \frac{3}{2}$ (vi) $2\frac{2}{3} + 3\frac{1}{2}$ (vii) $8\frac{1}{2} + 3\frac{5}{8}$

Sol: (i) $2 - \frac{3}{5} = \frac{2 \times 5}{5} - \frac{3}{5} = \frac{10-3}{5} = \frac{7}{5}$

(ii) $4 + \frac{7}{8} = \frac{4 \times 8}{8} + \frac{7}{8} = \frac{(4 \times 8) + 7}{8} = 4\frac{7}{8}$

(iii) $\frac{3}{5} + \frac{2}{7} = \frac{21+10}{35} = \frac{31}{35}$

(iv) $\frac{9}{11} - \frac{4}{15} = \frac{135-44}{165} = \frac{91}{165}$

(v) $\frac{7}{10} - \frac{2}{5} + \frac{3}{2} = \frac{7+4+15}{10} = \frac{21}{10} = \frac{13}{5} = 2\frac{3}{5}$

(vi) $2\frac{2}{3} + 3\frac{1}{2} = \frac{8}{3} + \frac{7}{2} = \frac{16+21}{6} = \frac{37}{6} = 6\frac{1}{6}$

(vii) $8\frac{1}{2} - 3\frac{5}{8} = \frac{17}{2} - \frac{29}{8} = \frac{68+29}{8} = \frac{39}{8} = 4\frac{7}{8}$

Q.2 Arrange the following in descending order:

(i) $\frac{2}{9}, \frac{2}{3}, \frac{8}{21}$ (ii) $\frac{1}{5}, \frac{3}{7}, \frac{7}{10}$

Sol: (i) $\frac{2}{9}, \frac{2}{3}, \frac{8}{21}$

Changing them to like fractions, we obtain

$$\frac{2}{9} = \frac{2 \times 7}{9 \times 7} = \frac{14}{63} \quad \frac{2}{3} = \frac{2 \times 21}{3 \times 21} = \frac{42}{63} \quad \frac{8}{21} = \frac{8 \times 3}{21 \times 3} = \frac{24}{63}$$

Since $42 > 24 > 14$,

$$\frac{2}{3} > \frac{8}{21} > \frac{2}{9}$$

(ii) $\frac{1}{5}, \frac{3}{7}, \frac{7}{10}$

Changing them to like fractions, we obtain

$$\frac{1}{5} = \frac{1 \times 14}{5 \times 14} = \frac{14}{70} \quad \frac{3}{7} = \frac{3 \times 10}{7 \times 10} = \frac{30}{70} \quad \frac{7}{10} = \frac{7 \times 7}{10 \times 7} = \frac{49}{70}$$

Since $49 > 30 > 14$,

$$\frac{7}{10} > \frac{3}{7} > \frac{1}{5}$$

Q.3 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?

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

Sol: Along the first row $\frac{4}{11} + \frac{9}{11} + \frac{2}{11} = \frac{15}{11}$

$$\text{Along the first row, sum} = \frac{4}{11} + \frac{9}{11} + \frac{2}{11} = \frac{15}{11}$$

$$\text{Along the second row, sum} = \frac{3}{11} + \frac{5}{11} + \frac{7}{11} = \frac{3+5+7}{11} = \frac{15}{11}$$

$$\text{Along the third row, sum} = \frac{8}{11} + \frac{1}{11} + \frac{6}{11} = \frac{8+1+6}{11} = \frac{15}{11}$$

$$\text{Along the first column, sum} = \frac{4}{11} + \frac{3}{11} + \frac{8}{11} = \frac{4+3+8}{11} = \frac{15}{11}$$

$$\text{Along the second column, sum} = \frac{9}{11} + \frac{5}{11} + \frac{1}{11} = \frac{9+5+1}{11} = \frac{15}{11}$$

$$\text{Along the third column, sum} = \frac{2}{11} + \frac{7}{11} + \frac{9}{11} = \frac{2+7+9}{11} = \frac{15}{11}$$

$$\text{Along the first diagonal, sum} = \frac{4}{11} + \frac{5}{11} + \frac{6}{11} = \frac{4+5+6}{11} = \frac{15}{11}$$

$$\text{Along the second diagonal, sum} = \frac{2}{11} + \frac{5}{11} + \frac{8}{11} = \frac{2+5+8}{11} = \frac{15}{11}$$

Since the sum of the numbers in each row, in each column, and along the diagonals is the same, it is a magic square.

Q.4 A rectangular sheet of paper is $12\frac{1}{2}$ cm long and $10\frac{2}{3}$ cm wide. Find its perimeter.

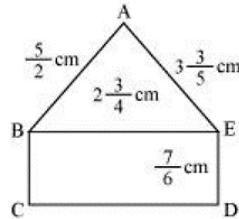
Sol: $Length = 12\frac{1}{2} = \frac{25}{2}$

$$Breadth = 10\frac{2}{3} = \frac{32}{3}$$

$$Perimeter = 2 \times (Length + Breadth)$$

$$= 2 \times \left[\frac{25}{2} + \frac{32}{3} \right] = 2 \times \left[\frac{(25 \times 3) + (32 \times 2)}{6} \right] = 2 \times \left[\frac{75+64}{6} \right] = 2 \times \frac{139}{6} = \frac{139}{3} = 46\frac{1}{3} \text{ cm}$$

Q.5 Find the perimeters of (i) ΔABE (ii) the rectangle BCDE in this figure. Whose perimeter is greater?



Sol: (i) Perimeter of $\Delta ABE = AB + BE + EA$

$$= \left(\frac{5}{2} + 2\frac{3}{4} + 3\frac{3}{5} \right) = \left(\frac{5}{2} + \frac{11}{4} + \frac{18}{5} \right) = \left(\frac{5 \times 10}{2 \times 10} + \frac{11 \times 5}{4 \times 5} + \frac{18 \times 4}{5 \times 4} \right) = \frac{50 + 55 + 72}{20} = \frac{177}{20} = 8\frac{17}{20}$$

$$\text{Perimeter of } \Delta ABE = \frac{177}{20}$$

(ii) Perimeter of rectangle = 2 (Length + Breadth)

$$= 2 \left[\frac{11}{4} + \frac{7}{6} \right] = 2 \left[\frac{11 \times 3}{4 \times 3} + \frac{7 \times 2}{6 \times 2} \right] = 2 \left[\frac{33 + 14}{12} \right] = 2 \times \frac{47}{12} = \frac{47}{6} = 7\frac{5}{6} \text{ cm}$$

Changing them to like fractions, we obtain

$$\frac{177}{20} = \frac{177 \times 3}{20 \times 3} = \frac{531}{60} \quad \frac{47}{6} = \frac{47 \times 10}{6 \times 10} = \frac{470}{60}$$

As $531 > 470$,

$$\Rightarrow \frac{177}{20} > \frac{47}{6}$$

Perimeter (ΔABE) > Perimeter (BCDE)

Q.6 Salil wants to put a picture in a frame. The picture is $7\frac{3}{5}$ cm wide. To fit in the frame the picture cannot be more than $7\frac{3}{10}$ cm wide. How much should the picture be trimmed?

Sol: The width of the picture = $7\frac{3}{5} = \frac{38}{5}$ cm

$$\text{Required width} = 7\frac{3}{10} = \frac{73}{10} \text{ cm}$$

The picture should be trimmed by

$$= \left(\frac{38}{5} - \frac{73}{10} \right) = \left(\frac{38 \times 2}{5 \times 2} - \frac{73}{10} \right) = \frac{76-73}{10} = \frac{3}{10} \text{ cm}$$

Q.7 Ritu ate $\frac{3}{5}$ part of an apple and the remaining apple was eaten by her brother Somu. How many parts of the apple did Somu eat? Who had the larger share? By how much?

Sol: Parts of apple eaten by Ritu = $\frac{3}{5}$

$$\begin{aligned} \text{Parts of apple eaten by Somu} &= 1 - \text{Parts of apple eaten by Ritu} \\ &= 1 - \frac{3}{5} = \frac{2}{5} \end{aligned}$$

Therefore, Somu ate $\frac{2}{5}$ parts of the apple.

Since $3 > 2$, Ritu had the larger share.

$$\text{Difference between the 2 shares} = \frac{3}{5} - \frac{2}{5} = \frac{1}{5}$$

Therefore, Ritu's share is larger than the share of Somu by $\frac{1}{5}$.

Q.8 Michael finished coloring a picture in $\frac{7}{12}$ hour. Vaibhav finished coloring the same picture in $\frac{3}{4}$ hour. Who worked longer? By what fraction was it longer?

Sol: Time taken by Michael = $\frac{7}{12}$ hr

$$\text{Time taken by Vaibhav} = \frac{3}{4} \text{ hr}$$

Converting these fractions into like fractions, we obtain

$$\frac{3}{4} = \frac{3 \times 3}{4 \times 3} = \frac{9}{12} \text{ And, } \frac{7}{12}$$

Since $9 > 7$,

Vaibhav worked longer.

$$\text{Difference} = \frac{9}{12} - \frac{7}{12} = \frac{2}{12} = \frac{1}{6} \text{ hour}$$

Hence, Vaibhav worked longer by $\frac{1}{6}$ hour than Michael.