

CBSE Class -VII Mathematics NCERT

Solutions

Chapter 2 Fractions and Decimals (Ex. 2.1)

Question 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) $8\frac{1}{2} - 3\frac{5}{8}$

Answer: (i) $2 - \frac{3}{5} = \frac{10-3}{5} = \frac{7}{5} = 1\frac{2}{5}$

(ii) $4 + \frac{7}{8} = \frac{32+7}{8} = \frac{39}{8} = 4\frac{7}{8}$

(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) $\frac{7}{10} + \frac{2}{5} + \frac{3}{2} = \frac{7+4+15}{10} = \frac{26}{10} = \frac{13}{5} = 2\frac{3}{5}$

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

Question 2. Arrange the following in descending order:

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

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

Answer: (i) $\frac{2}{9}, \frac{2}{3}, \frac{8}{21} \Rightarrow \frac{14}{63}, \frac{42}{63}, \frac{24}{63}$ [Converting into like fractions]

$\Rightarrow \frac{42}{63} > \frac{24}{63} > \frac{14}{63}$ [Arranging in descending order]

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

(ii) $\frac{1}{5}, \frac{3}{7}, \frac{7}{10} \Rightarrow \frac{14}{70}, \frac{30}{70}, \frac{49}{70}$ [Converting into like fractions]

$$\Rightarrow \frac{49}{70} > \frac{30}{70} > \frac{14}{70} \text{ [Arranging in descending order]}$$

$$\text{Therefore, } \frac{7}{10} > \frac{3}{7} > \frac{1}{5}$$

Question 3. In a “magic square”, the sum of the numbers in each row, in each column and along the diagonals is the same. Is this a magic square?

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

$$\left(\text{Along the first row } \frac{4}{11} + \frac{9}{11} + \frac{2}{11} = \frac{15}{11} \right)$$

$$\text{Answer: Sum of first row} = \frac{4}{11} + \frac{9}{11} + \frac{2}{11} = \frac{15}{11} \text{ [Given]}$$

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

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

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

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

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

$$\text{Sum of first diagonal (left to right)} = \frac{4}{11} + \frac{5}{11} + \frac{6}{11} = \frac{4+5+6}{11} = \frac{15}{11}$$

$$\text{Sum of second diagonal (left to right)} = \frac{2}{11} + \frac{5}{11} + \frac{8}{11} = \frac{2+5+8}{11} = \frac{15}{11}$$

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

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

Answer: Given: The sheet of paper is in rectangular form.

$$\text{Length of sheet} = 12\frac{1}{2} \text{ cm and Breadth of sheet} = 10\frac{2}{3} \text{ cm}$$

Perimeter of rectangle = 2 (length + breadth)

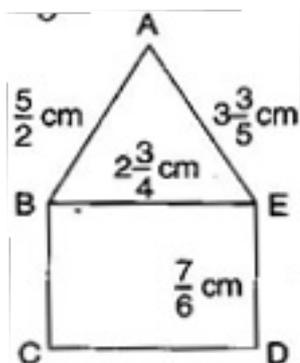
$$= 2 \left(12\frac{1}{2} + 10\frac{2}{3} \right) = 2 \left(\frac{25}{2} + \frac{32}{3} \right)$$

$$= 2 \left(\frac{25 \times 3 + 32 \times 2}{6} \right) = 2 \left(\frac{75 + 64}{6} \right)$$

$$= 2 \times \frac{139}{6} = \frac{139}{3} = 46\frac{1}{3} \text{ cm.}$$

Thus, the perimeter of the rectangular sheet is $46\frac{1}{3}$ cm.

Question 5. Find the perimeter of (i) $\triangle ABE$, (ii) the rectangle BCDE in this figure. Whose perimeter is greater?



Answer: (i) In $\triangle ABE$, $AB = \frac{5}{2}$ cm, $BE = 2\frac{3}{4}$ cm, $AE = 3\frac{3}{5}$ cm

The perimeter of $\triangle ABE = AB + BE + AE$

$$= \frac{5}{2} + 2\frac{3}{4} + 3\frac{3}{5} = \frac{5}{2} + \frac{11}{4} + \frac{18}{5}$$

$$= \frac{50 + 55 + 72}{20} = \frac{177}{20} = 8\frac{17}{20} \text{ cm}$$

Thus, the perimeter of $\triangle ABE$ is $8\frac{17}{20}$ cm.

(ii) In rectangle BCDE, $BE = 2\frac{3}{4}$ cm, $ED = \frac{7}{6}$ cm

Perimeter of rectangle = 2 (length + breadth)

$$= 2 \left(2\frac{3}{4} + \frac{7}{6} \right) = 2 \left(\frac{11}{4} + \frac{7}{6} \right)$$

$$= 2 \left(\frac{33 + 14}{12} \right) = \frac{47}{6} = 7\frac{5}{6} \text{ cm}$$

Thus, the perimeter of rectangle BCDE is $7\frac{5}{6}$ cm.

Comparing the perimeter of triangle and that of rectangle,

$$8\frac{17}{20} \text{ cm} > 7\frac{5}{6} \text{ cm}$$

Therefore, the perimeter of triangle ABE is greater than that of rectangle BCDE.

Question 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?

Answer: Given: The width of the picture = $7\frac{3}{5}$ cm and the width of picture frame = $7\frac{3}{10}$ cm

$$\begin{aligned} \text{Therefore, the picture should be trimmed} &= 7\frac{3}{5} - 7\frac{3}{10} = \frac{38}{5} - \frac{73}{10} \\ &= \frac{76-73}{10} = \frac{3}{10} \text{ cm} \end{aligned}$$

Thus, the picture should be trimmed by $\frac{3}{10}$ cm.

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

Answer: The part of an apple eaten by Ritu = $\frac{3}{5}$

$$\text{The part of an apple eaten by Somu} = 1 - \frac{3}{5} = \frac{5-3}{5} = \frac{2}{5}$$

Comparing the parts of apple eaten by both Ritu and Somu $\frac{3}{5} > \frac{2}{5}$

Larger share will be more by $\frac{3}{5} - \frac{2}{5} = \frac{1}{5}$ part.

Thus, Ritu's part is $\frac{1}{5}$ more than Somu's part.

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

Answer: Time taken by Michael to colour the picture = $\frac{7}{12}$ hour

Time taken by Vaibhav to colour the picture = $\frac{3}{4}$ hour

Converting both fractions in like fractions, $\frac{7}{12}$ and $\frac{3 \times 3}{4 \times 3} = \frac{9}{12}$

Here, $\frac{7}{12} < \frac{9}{12} \Rightarrow \frac{7}{12} < \frac{3}{4}$

Thus, Vaibhav worked longer time.

Vaibhav worked longer time by $\frac{3}{4} - \frac{7}{12} = \frac{9-7}{12} = \frac{2}{12} = \frac{1}{6}$ hour.

Thus, Vaibhav took $\frac{1}{6}$ hour more than Michael.