Mathematics

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(Chapter – 2) (Fractions and Decimals)
(Class – VII)

Exercise 2.3

Question 1:
Find:

(i) \( \frac{1}{4} \) of \( \frac{1}{4} \) (a) \( \frac{1}{4} \) (b) \( \frac{3}{5} \) (c) \( \frac{4}{3} \)
(ii) \( \frac{1}{7} \) of \( \frac{2}{9} \) (a) \( \frac{2}{9} \) (b) \( \frac{6}{5} \) (c) \( \frac{3}{10} \)

Answer 1:

(i) (a) \( \frac{1}{4} \) of \( \frac{1}{4} \) = \( \frac{1}{4} \times \frac{1}{4} = \frac{1\times1}{4\times4} = \frac{1}{16} \)
(b) \( \frac{1}{4} \) of \( \frac{3}{5} \) = \( \frac{1}{4} \times \frac{3}{5} = \frac{1\times3}{4\times5} = \frac{3}{20} \)
(c) \( \frac{1}{4} \) of \( \frac{4}{3} \) = \( \frac{1}{4} \times \frac{4}{3} = \frac{1\times1}{4\times3} = \frac{1}{12} \)

(ii) (a) \( \frac{1}{7} \) of \( \frac{2}{9} \) = \( \frac{1}{7} \times \frac{2}{9} = \frac{1\times2}{7\times9} = \frac{2}{63} \)
(b) \( \frac{1}{7} \) of \( \frac{2}{9} \) = \( \frac{1}{7} \times \frac{6}{5} = \frac{1\times6}{7\times5} = \frac{6}{35} \)
(c) \( \frac{1}{7} \) of \( \frac{2}{9} \) = \( \frac{1}{7} \times \frac{3}{10} = \frac{1\times3}{7\times10} = \frac{3}{70} \)

Question 2:
Multiply and reduce to lowest form (if possible):

(i) \( \frac{2}{3} \times \frac{2}{3} \) (ii) \( \frac{2}{7} \times \frac{7}{9} \) (iii) \( \frac{3}{8} \times \frac{6}{4} \) (iv) \( \frac{9}{5} \times \frac{3}{5} \)
(v) \( \frac{1}{3} \times \frac{15}{8} \) (vi) \( \frac{11}{2} \times \frac{3}{10} \) (vii) \( \frac{4}{5} \times \frac{12}{7} \)

Answer 2:

(i) \( \frac{2}{3} \times \frac{2}{3} = \frac{2\times2}{3\times3} = \frac{4}{9} = \frac{1}{\frac{9}{4}} \)
(ii) \( \frac{2}{7} \times \frac{7}{9} = \frac{2\times7}{7\times9} = \frac{14}{63} = \frac{2}{9} \)
(iii) \( \frac{3}{8} \times \frac{6}{4} = \frac{3\times6}{8\times4} = \frac{18}{32} = \frac{9}{16} \)
(iv) \( \frac{9}{5} \times \frac{3}{5} = \frac{27}{25} \)
(v) \( \frac{1}{3} \times \frac{15}{8} = \frac{1\times15}{3\times8} = \frac{15}{24} = \frac{5}{8} \)
(vi) \( \frac{11}{2} \times \frac{3}{10} = \frac{11\times3}{2\times10} = \frac{33}{20} = 1\frac{3}{20} \)
(vii) \( \frac{4}{5} \times \frac{12}{7} = \frac{4\times12}{5\times7} = \frac{48}{35} = 1\frac{13}{35} \)

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Question 3:
Multiply the following fractions:

(i) \( \frac{2}{5} \times \frac{5}{4} \)  \hspace{1cm} (ii) \( \frac{6}{5} \times \frac{7}{9} \)  \hspace{1cm} (iii) \( \frac{5}{2} \times \frac{1}{3} \)  \hspace{1cm} (iv) \( \frac{5}{6} \times \frac{2}{3} \)

(v) \( \frac{2}{3} \times \frac{4}{7} \)  \hspace{1cm} (vi) \( \frac{2}{3} \times \frac{3}{5} \)  \hspace{1cm} (vii) \( \frac{3}{4} \times \frac{3}{7} \)

Answer 3:

(i) \( \frac{2}{5} \times \frac{5}{4} = \frac{2 \times 5}{5 \times 4} = \frac{10}{20} = \frac{1}{2} \)

(ii) \( \frac{6}{5} \times \frac{7}{9} = \frac{42}{45} = \frac{14}{15} \)

(iii) \( \frac{3}{2} \times \frac{1}{3} = \frac{3 \times 1}{6} = \frac{3}{6} = \frac{1}{2} \)

(iv) \( \frac{5}{6} \times \frac{2}{3} = \frac{10}{18} = \frac{5}{9} \)

(v) \( \frac{2}{3} \times \frac{4}{7} = \frac{8}{21} \)

(vi) \( \frac{3}{5} \times \frac{3}{1} = \frac{9}{5} \)

(vii) \( \frac{3}{4} \times \frac{3}{7} = \frac{9}{28} \)

Question 4:
Which is greater:  \hspace{1cm} (i) \( \frac{2}{3} \) of \( \frac{3}{4} \) or \( \frac{3}{5} \) of \( \frac{5}{8} \)  \hspace{1cm} (ii) \( \frac{1}{2} \) of \( \frac{6}{7} \) or \( \frac{2}{3} \) of \( \frac{3}{7} \)

Answer 4:

(i) \( \frac{2}{3} \) of \( \frac{3}{4} \) or \( \frac{3}{5} \) of \( \frac{5}{8} \)

\[
\Rightarrow \frac{2}{3} \times \frac{3}{4} \text{ or } \frac{3}{5} \times \frac{5}{8}
\]

\[
\Rightarrow \frac{3}{4} \text{ or } \frac{3}{8}
\]

Thus, \( \frac{3}{4} \) of \( \frac{5}{8} \) is greater.

(ii) \( \frac{1}{2} \) of \( \frac{6}{7} \) or \( \frac{2}{3} \) of \( \frac{3}{7} \)

\[
\Rightarrow \frac{1}{2} \times \frac{6}{7} \text{ or } \frac{2}{3} \times \frac{3}{7}
\]

\[
\Rightarrow \frac{3}{7} \text{ or } \frac{2}{7}
\]

Thus, \( \frac{1}{2} \) of \( \frac{6}{7} \) is greater.

Question 5:
Saili plants 4 saplings in a row in her garden. The distance between two adjacent saplings is \( \frac{3}{4} \) m. Find the distance between the first and the last sapling.

Answer 5:
The distance between two adjacent saplings = \( \frac{3}{4} \) m

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Saili planted 4 saplings in a row, then number of gap in saplings = 3

Therefore,
The distance between the first and the last saplings = $3 \times \frac{3}{4} = \frac{9}{4} \text{ m} = 2 \frac{1}{4} \text{ m}$

Thus the distance between the first and the last saplings is $2 \frac{1}{4} \text{ m}$.

**Question 6:**
Lipika reads a book for $1 \frac{3}{4}$ hours everyday. She reads the entire book in 6 days. How many hours in all were required by her to read the book?

**Answer 6:**

Time taken by Lipika to read a book = $1 \frac{3}{4}$ hours.

She reads entire book in 6 days.

Now, hours taken by her to read the entire book = $1 \frac{3}{4} \times 6 = \frac{7}{4} \times 6 = \frac{21}{2} = 10 \frac{1}{2}$

Thus, 10 hours were required by her to read the book.

**Question 7:**
A car runs 16 km using 1 litre of petrol. How much distance will it cover using $2 \frac{3}{4}$ litres of petrol?

**Answer 7:**

In 1 litre of petrol, car covers the distance = 16 km

In $2 \frac{3}{4}$ litres of petrol, car covers the distance = $2 \frac{3}{4}$ of 16 km = $\frac{11}{4} \times 16 = 44$ km

Thus, the car will cover 44 km distance.

**Question 8:**

(a) (i) Provide the number in the box [ ] such that $\frac{2}{3} \times [ ] = \frac{10}{30}$.

(ii) The simplest form of the number obtained in [ ] is ________.

(b) (i) Provide the number in the box [ ] such that $\frac{3}{5} \times [ ] = \frac{24}{75}$.

(ii) The simplest form of the number obtained in [ ] is ________.

**Answer 8:**

(a) (i) $\frac{2}{3} \times \frac{5}{10} = \frac{10}{30}$

(ii) The simplest form of $\frac{5}{10}$ is $\frac{1}{2}$.

(b) (i) $\frac{3}{5} \times \frac{8}{15} = \frac{24}{75}$

(ii) The simplest form of $\frac{8}{15}$ is $\frac{8}{15}$. 