Tender Heart High School; Sec-33B, Chandigarh

Class – VI
Subject – Maths

Date – 22.07.24
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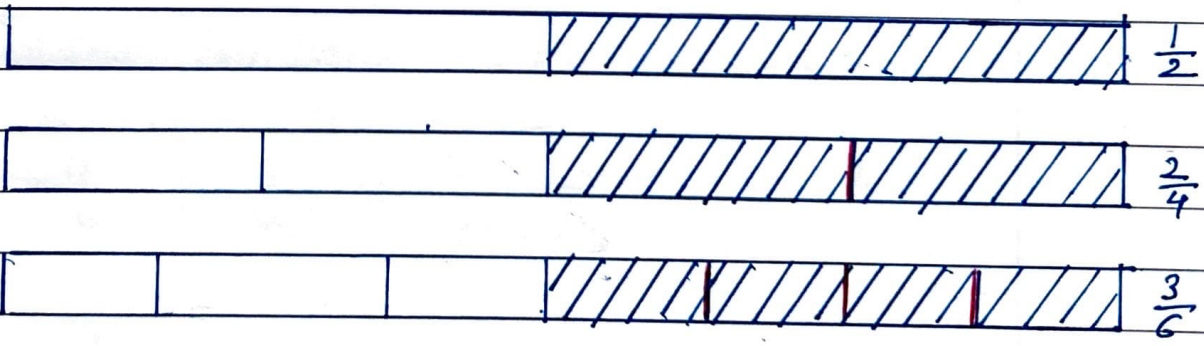
## Ch-4 FRACTIONS

**Fractions :→**

The numbers of the form $\frac{a}{b}$, where a and b are natural numbers, are called fractions.
In the fraction, $\frac{a}{b}$, we a as numerator and b as denominator.

**Equivalent Fractions :→**

Two or more fractions representing the same part of a whole are called equivalent fractions.




Clearly, the shaded portions of these figures are equal.

$\therefore \frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \frac{4}{8} = \dots$

# Exercise 4A

Q.1 Write a fraction for each of the following.

(i) 4 parts out of 9 equal parts → $\frac{4}{9}$

(ii) Six-eighths → $\frac{6}{8}$

(iii) 5 parts out of 11 equal parts → $\frac{5}{11}$

Q2. Point out the numerator and denominator in each of the following fractions:

(i) $\frac{5}{6}$ → Numerator
6 → Denominator

(ii) $\frac{3}{7}$ → Numerator
7 → Denominator

Q3. Write five fractions equivalent to each of the following:

(i) $\frac{2}{3} = \frac{4}{6} = \frac{6}{9} = \frac{8}{12} = \frac{10}{15} = \frac{12}{18}$

(ii) $\frac{5}{6} = \frac{10}{12} = \frac{15}{18} = \frac{20}{24} = \frac{25}{30} = \frac{30}{36}$

Q4. Which of the following are the pairs of equivalent fractions?

(i) $\frac{4}{5}$ and $\frac{24}{30}$

The given fractions are $\frac{4}{5}$ and $\frac{24}{30}$

Cross multiply, $\frac{4}{5} \times \frac{24}{30}$

Here, $4 \times 30 = 120$

$24 \times 5 = 120$

∴ The cross products are equal.

Hence, $\frac{4}{5}$ and $\frac{24}{30}$ are equivalent fractions.

(ii) $\frac{7}{11}$ and $\frac{21}{32}$

The given fractions are: $\frac{7}{11}$ and $\frac{21}{32}$

Cross multiply :- $\frac{7}{11} \times \frac{21}{32}$

Here,

$7 \times 32 = 224$

$21 \times 11 = 231$

∴ The cross products are not equal.

Hence, $\frac{7}{11}$ and $\frac{21}{32}$ are not equivalent fractions

Qu Write an equivalent fraction of :-

(i) $\frac{4}{5}$ with numerator 32

Soln:→ Let $\frac{4}{5} = \frac{32}{?}$

Then, we have to find the missing numeral.

To get 32 in the numerator, we multiply 4 by 8.

∴ We multiply the denominator also by 8.

$$\frac{4}{5} \times \frac{8}{8} = \frac{32}{40}$$

Hence, $\frac{4}{5}$ and $\frac{32}{40}$ are equivalent fractions.

(ii) $\frac{10}{13}$ with denominator 78.

Soln:- Let $\frac{10}{13} = \frac{?}{78}$

To get 78 in the denominator, we multiply 13 by 6.
∴ We multiply the numerator also by 6.

$$\therefore \frac{10}{13} \times \frac{6}{6} = \frac{60}{78}$$

Hence, $\frac{10}{13}$ and $\frac{60}{78}$ are equivalent fractions.

Q. Write an equivalent fraction of:-

(i) $\frac{32}{48}$ with numerator 2.

Soln:→ Let $\frac{32}{48} = \frac{2}{?}$

To get 2 in the numerator, we divid, 48 by 16.
So, we divide the denominator also by 16.

$$\therefore \frac{32 \div 16}{48 \div 16} = \frac{2}{3}$$

Hence $\frac{32}{48}$ and $\frac{2}{3}$ are equivalent fractions.

Required fraction $= \frac{25}{60}$

Qn. What fraction of a day is 9 hours?

Soln:- 1 day = 24 hours.

Required fraction $= \frac{9}{24}$

## FRACTIONS IN SIMPLEST FORM:→

If the numerator and the denominator of a fraction have no common factor other than 1, then it is said to be in simplest form or in lowest terms or irreducible.

Method to reduce a fraction to simplest form:-

1. H.C.F. Method
2. Prime Factorisation Method

### Exercise 4B

1. Which of the following fractions are in simplest form?

(i) $\frac{21}{40}$

Soln:→ The given fraction is $\frac{21}{40}$.

We find the H.C.F. of 21 and 40

$$
\begin{array}{r|l}
 & 1 \\
\hline
21 & 40 \\
-21 & 1 \\
\hline
19 & 21 \\
-19 & 9 \\
\hline
2 & 19 \\
-18 & 2 \\
\hline
1 & 2 \\
 & -2 \\
\hline
 & 0
\end{array}
$$

$\therefore$ The HCF of $(21, 40) = 1$

Hence $\frac{21}{40}$ is in its simplest form.

(ii) $\frac{64}{81}$

We find the H.C.F. of 64 and 81.

$$
\begin{array}{r}
1 \\
64 \overline{)\,81\,(} \\
-\,64 \\
\hline
17 \overline{)\,64\,(\,3} \\
-\,51 \\
\hline
3 \overline{)\,17\,(\,1} \\
-\,13 \\
\hline
4 \overline{)\,13\,(\,3} \\
-\,12 \\
\hline
1 \overline{)\,4\,(\,1} \\
-\,4 \\
\hline
0
\end{array}
$$

~~We find the~~ ∴ The H.C.F of 64 and 81 is 1

Hence, $\frac{64}{81}$ is in its simplest form.

Qu2 - Reduce each of the following fractions to its lowest terms.

(i) $\frac{27}{36}$

H.C.F (27, 36) = 9

$$
\begin{array}{r}
1 \\
27 \overline{)\,36\,(} \\
-\,27 \\
\hline
9 \overline{)\,27\,(\,3} \\
-\,27 \\
\hline
0
\end{array}
$$

$\therefore \frac{27 \div 9}{36 \div 9} = \frac{3}{4}$

$\therefore \frac{3}{4}$ is the lowest form of $\frac{27}{36}$

ii) $\frac{58}{87}$

$\therefore$ HCF of (58, 87) = 29

$$58 \overline{)87} \ (1$$
$$-58$$
$$29 \overline{)58} \ (2$$
$$-58$$
$$0$$

$\therefore \frac{58 \div 29}{87 \div 29} = \frac{2}{3}$ Ans:-

(iii) $\frac{105}{168}$

HCF of (105, 168) = 21

$$105 \overline{)168} \ (1$$
$$-105$$
$$63 \overline{)105} \ (1$$
$$-63$$
$$42 \overline{)63} \ (1$$
$$-42$$
$$21 \overline{)42} \ (2$$
$$-42$$
$$0$$

$\therefore \frac{105 \div 21}{168 \div 21} = \frac{5}{8}$ Ans