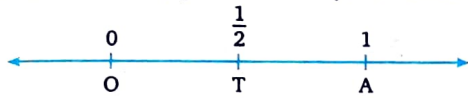point A to represent 1 and mark an another point O to represent 0 (zero). Now, divide the gap between O and A into two equal parts. Let T be the point of division. Then, point T represents 1/2.

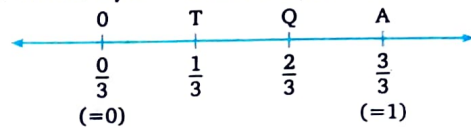O To represent 1/3 on a number line, we divide the gap between O and A into 3 equal parts. Let T and Q be the points of division. Then, T represents 1/3 and Q represents 2/3, because 2/3 means 2 parts out of 3 equal parts as shown below.
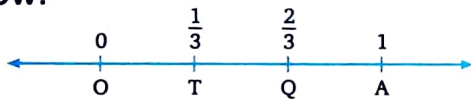
We have $0/3 = 0$ and $3/3 = 1$
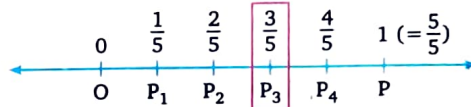

O In order to represent 3/5 on a number line, we divide the gap between 0 and 1 into 5 equal parts and take first 3 parts from 0 as shown below.

Fraction 3/5 on a Number Line

● EXERCISE 5.1

1. Write the fraction for each of the following :

(a)

(b)

(c)

(d)

(e)

(f)
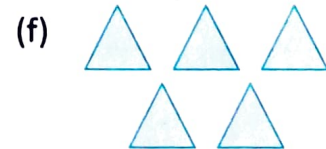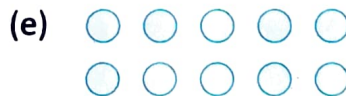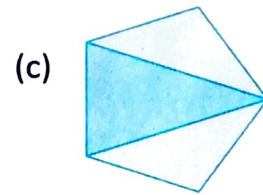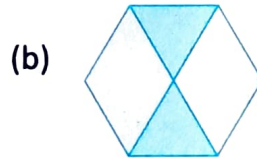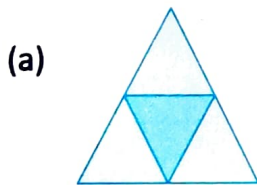
2. Shaded the portion according to the fraction given :

(a)

$\dfrac{3}{8}$

(b)

$\dfrac{3}{9}$

(c)

$\dfrac{2}{12}$

(d)

$\dfrac{5}{12}$
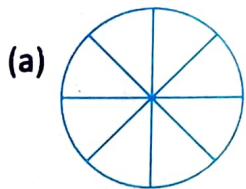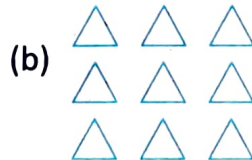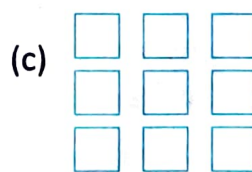
3. What fraction of a week are 3 days?

4. What fraction of an hour is 15 minutes?

5. What fraction of a kg is 550 gm?

6. Vivek spend 10 hours on his study. He spends 2 hrs of them on mathematics. What fraction of his study hours is devoted to mathematics?

7. In an Examination, 1500 students appeared. 150 of them could not clear the exam. Find the fraction of those student who could not clear the exam.

8. Write all the natural numbers from 20 to 35. What fraction of them are:
   - (a) Prime numbers
   - (b) Even numbers
   - (c) Composite numbers.

9. Write all integers from –2 to 5. What fraction of negative integers is?

10. A bag has 20 white balls, 10 red and 15 black balls. Find the fraction of
    - (a) white balls
    - (b) red balls
    - (c) black balls

11. Write the numerator (Nr) and Denominator (Dr) of each fraction :
    - (a) $\dfrac{2}{5}$ Nr = ... Dr = ...
    - (b) $\dfrac{7}{11}$ Nr = ... Dr = ...
    - (c) $\dfrac{8}{15}$ Nr = ...
    - (d) $\dfrac{16}{23}$ Nr = ...

12. Write the fraction whose :
    - (a) Nr = 3, Dr = 7
    - (b) Dr = 15, Nr = 11
    - (c) Nr = 5, Dr = 12
    - (d) Dr = 27, Nr = 8
    - (e) Nr = 3, Dr = 28
    - (f) Dr = 15, Nr = 16

13. Represent $\dfrac{0}{10}, \dfrac{1}{10}, \dfrac{5}{10}$ and $\dfrac{10}{10}$ on a number line.

14. Represent $\dfrac{2}{5}$ on a number line.

15. Represent the number $\dfrac{2}{7}, \dfrac{5}{7}, \dfrac{6}{7}$ on a number line.

TYPES OF FRACTIONS

Like fractions : Fractions having the same denominators are called **like fractions.**

For example : $\dfrac{1}{5}, \dfrac{4}{5}, \dfrac{2}{5}, \dfrac{3}{5}$ etc., are like fractions.

Unlike fractions : Fractions having different denominators are called **unlike fractions.**

For example : $\dfrac{1}{5}, \dfrac{3}{7}, \dfrac{9}{6}, \dfrac{2}{7}$ etc., are unlike fractions.

Unit fraction : A fraction having 1 as a numerator is called a **unit fraction.**

For example : $\dfrac{1}{2}, \dfrac{1}{5}, \dfrac{1}{9}, \dfrac{1}{14}$ etc., are all unit fractions.

Proper fraction : A fraction numerator is smaller than its denominator is called a **proper fraction.**

For example : $\dfrac{6}{13}, \dfrac{4}{15}, \dfrac{17}{30}, \dfrac{20}{23}$, etc., are all proper fractions.

Improper fraction : A fractions in which the numerator is greater than or equal to its denominator is called an **improper fraction.**

For example : $\dfrac{13}{6}, \dfrac{15}{4}, \dfrac{20}{17}, \dfrac{23}{20}$ etc., are all improper fractions.

Mixed fraction : A fraction that is combination of a whole number and a proper fraction is called a mixed fraction.

1. Convert the following unlike fractions into like fractions.
   (a) $\dfrac{3}{4}, \dfrac{3}{10}$ and $\dfrac{1}{20}$
   (b) $\dfrac{3}{8}, \dfrac{5}{6}$ and $\dfrac{7}{36}$
   (c) $\dfrac{2}{15}, \dfrac{1}{45}$ and $\dfrac{3}{25}$
   (d) $\dfrac{1}{2}, \dfrac{3}{7}$ and

2. State which of the following are proper and which are improper fractions :
   (a) $\dfrac{1}{3}$
   (b) $\dfrac{4}{3}$
   (c) $\dfrac{7}{2}$
   (d) $\dfrac{10}{11}$
   (e) $\dfrac{26}{27}$
   (f) $\dfrac{17}{7}$

3. Convert the following mixed fractions into improver fractions :
   (a) $1\dfrac{1}{2}$
   (b) $5\dfrac{1}{4}$
   (c) $4\dfrac{1}{2}$
   (d) $2\dfrac{3}{10}$
   (e) $2\dfrac{2}{5}$
   (f) $4\dfrac{2}{3}$

4. Express these improper fractions as mixed fractions :
   (a) $\dfrac{7}{2}$
   (b) $\dfrac{5}{3}$
   (c) $\dfrac{4}{15}$
   (d) $\dfrac{12}{7}$
   (e) $\dfrac{13}{5}$
   (f) $\dfrac{17}{4}$
   (g) $\dfrac{15}{4}$
   (h) $\dfrac{19}{6}$

EQUIVALENT FRACTIONS

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

For example : $\dfrac{1}{2}, \dfrac{2}{4}, \dfrac{3}{6}$ and $\dfrac{4}{8}$ are equivalent fractions.
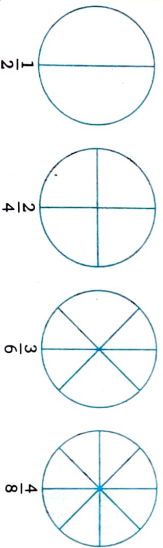
In each of the circles shown above half of the whole is shaded.

Thus, $\dfrac{1}{2} = \dfrac{2}{4} = \dfrac{3}{6} = \dfrac{4}{8}$

$\dfrac{1}{2}$

$\dfrac{2}{4}$

$\dfrac{3}{6}$

$\dfrac{4}{8}$

Getting Equivalent Fractions and Reducing Fractions

Once we have found the LCD for a set of fractions, the next step is to change each fraction to one of its equivalents so that we may add or subtract it.

An equivalent fraction has the same valu the original fraction.

For example : $\dfrac{2}{3} = \dfrac{4}{6}$ $\dfrac{2}{3} = \dfrac{6}{9}$ $\dfrac{2}{3} = \dfrac{8}{12}$

$\dfrac{2}{3} = \dfrac{10}{15}$ ...etc.

○ An equivalent fraction is obtained multiplying both the numerator denominator of the fraction by the sa **number**. This is called **BUILDING**.

For example :

(i) $\dfrac{5 \times 3}{8 \times 3} = \dfrac{15}{24}$ 5 and 8 were multiplied by 3

(ii) $\dfrac{7 \times 2}{12 \times 2} = \dfrac{14}{24}$ 7 and 12 were multiplied by 2

(iii) $\dfrac{1 \times 17}{3 \times 17} = \dfrac{17}{51}$ 1 and 3 were multiplied by 17