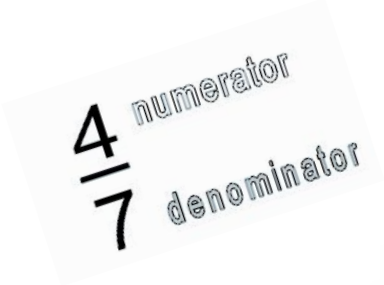
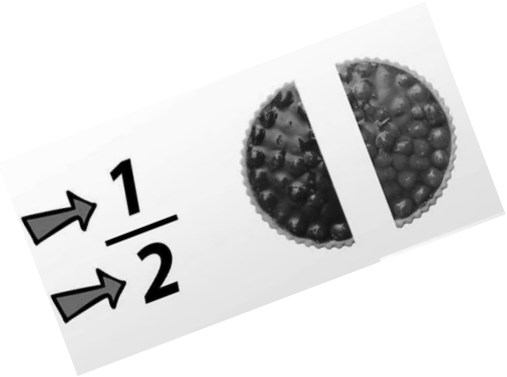
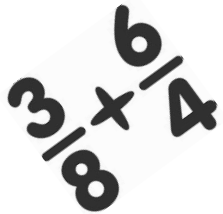


Lets learn about,

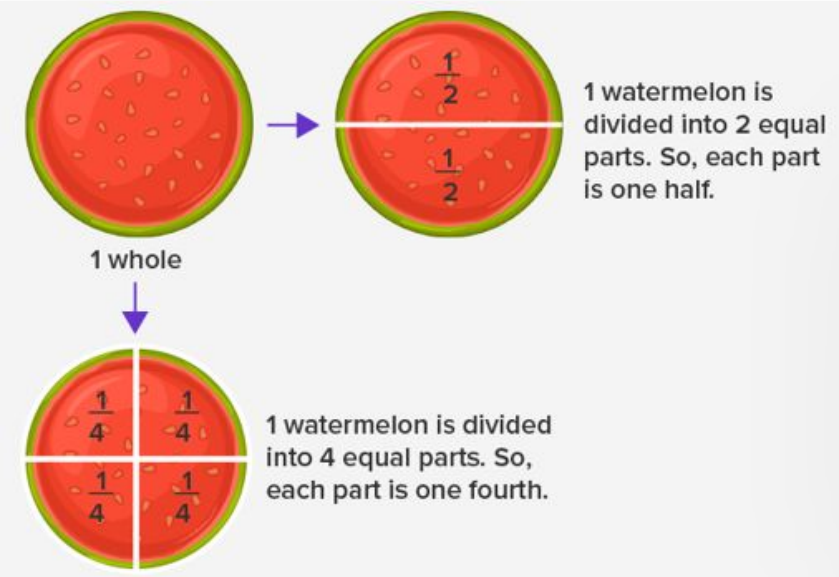
FRACTIONS





Introduction

You have four friends from school. One friend bought a large size watermelon. She cut the watermelon into four equal parts and said that each of us would get one part of the watermelon, which means one out of four parts.



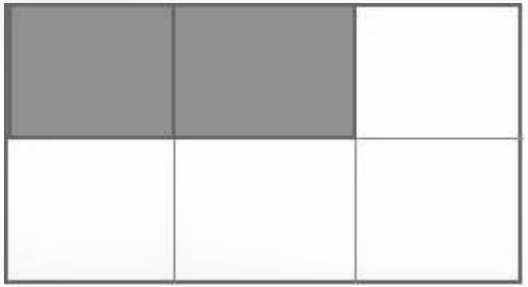
So, how fractions are defined is dividing an object into equal parts and taking a few parts out.

DEFINITION

A fraction is a number representing part of a whole. The whole may be a single object or a group of objects.

Example 1:

We have a grid that is divided into 6 equal parts with some shaded regions, Find the fractions?



Answer:

Here we have a rectangle that is divided into 6 equal parts in which two parts are shaded. The fraction of the shaded is **2/6.**

Here's the fraction 2/6, it can also be called as,

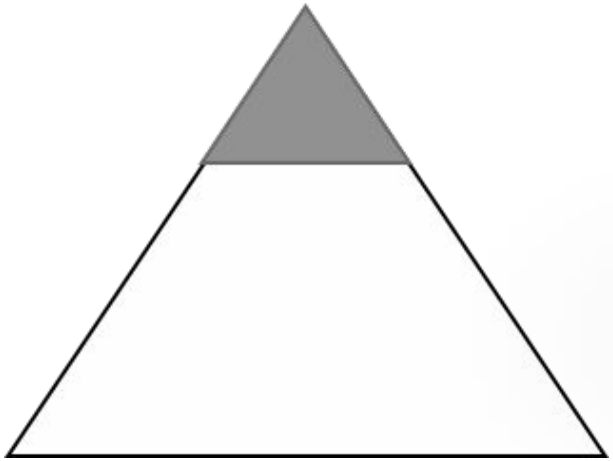
- Two out of six
- Two sixths

In the fraction 2/6, 2 is called **the numerator** and 6 is called **the denominator**.

Also, to represent a fraction of an object or group, the divided parts should always be equal. If they are not equal fractions never be defined.

Example 2:

State whether the given fractions for the following shaded figures are true or false.



a) Fraction of this shaded region is 1/2.?

Answer:

False, because the triangle is not divided into two equal parts.

Example 3:

Three friends Aaru, Aadhya, and Ani buy a chocolate bar. How can they share equally among themselves? Also, what is the fraction of chocolate each gets?

Answer:

To share the chocolate bar equally between 3 friends, the chocolate bar should be divided into three parts to get an equal share. As the chocolate is divided into 3 parts and each friend gets one part the fraction of the chocolate each get is **1/3.**

Points to Remember

1. A fraction is a quantity that expresses a part of the whole.
2. A fraction is a quantity that expresses a part of the whole.
3. FRACTION = $\frac{Numerator}{Denominator}$

Question 1

List numbers from 1 to 10, Write the fraction of prime numbers in it:

Solution:

First, list the numbers from 1 to 10 and then pick all the prime numbers, 1,2,3,4,5,6,7,8,9,10

Prime numbers in the listed numbers are 2,3,5,7.

So total numbers are 10, number of prime numbers are 4 .

The required fraction is **4/10**

1	2	3	4	5
6	7	8	9	10

$$\frac{4}{10}$$

Question:

What fraction of week is 3 days?

Solution:

Answer: 3/7

The total number of days in a week are 7.

So the fraction is 3 out of 7

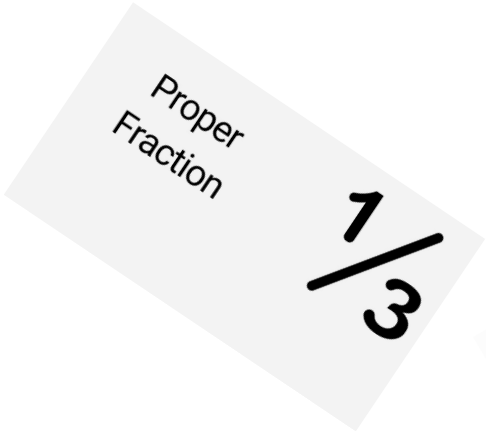
Sunday	Monday	Tuesday	Wednesday
Thursday	Friday		Saturday

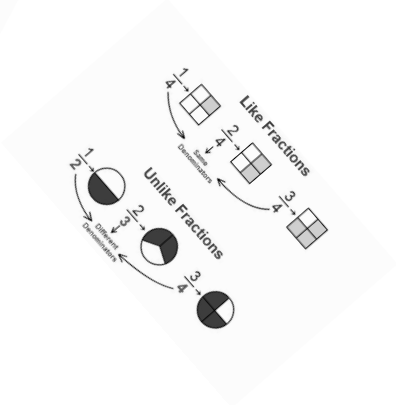
$\frac{3}{7}$

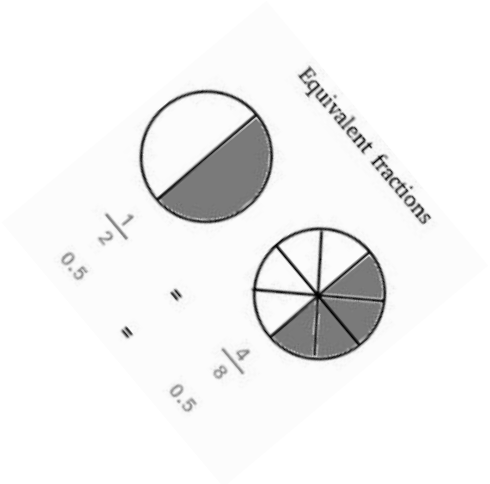
There are five types of Fractions,

Type of Fractions

- Proper Fractions
- Improper Fractions
- Mixed Fractions
- Like and Unlike Fractions
- Equivalent Fractions







Proper Fractions

Any fraction whose Numerator is **less** than its Denominator is called a **Proper fraction.**

Example: 2/3, 5/7, 9/11,….etc

Improper Fractions

Any fraction whose Numerator is more significant than its Denominator or **equal** to its Denominator is called **Improper Fraction**

Example: 4/3, 8/5, 11/3, 9/4,3/3, 5/5, 12/12,….etc

Mixed Fractions

A **mixed fraction** is a combination of an integer and a proper fraction.

Example: $3\frac{1}{3}$

Like and Unlike Fractions

Any number of fractions more than one having **the same Denominators but different Numerators** are called Like Fractions.

Example: 2/3, 3/3, 4/3, 5/3,…. Etc

Any number of fractions having **different Denominators** are called, Unlike fractions.

Example: 2/3, 2/5, 3/7, 5/8,…. Etc

Equivalent Fractions

If two or more fractions have **the same value, they are called Equivalent** or Equal fractions.

Any fraction which is multiplied or divided with the same number in Numerator and Denominator then the resultant fraction is said to be equivalent fractions.

Example: 2/3, 4/6, 6/9…. are all equivalent fractions

Question

Identify the type of following fractions

a) 2/3

Solution:

As **numerator** is less than **denominator**, then the given fraction is **proper fraction.**

$\frac{2}{3}$ ⟹ 2 is less than 3. ie, **Numerator** is **less** than **denominator**.
Therefore the given fraction is **proper fraction.**

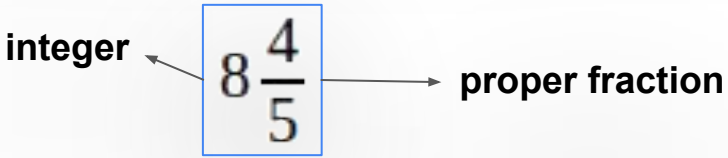
Question

Identify the type of fraction

a) $8\frac{4}{5}$

Solution:

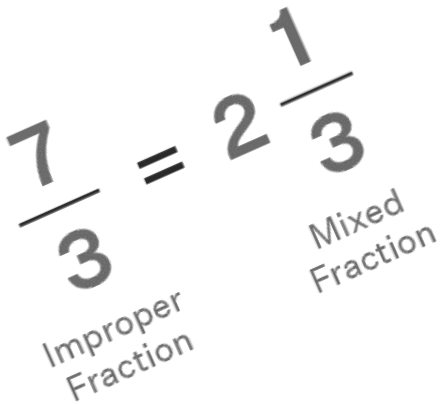
There is a combination of **integer** and **proper fraction** so the fraction is a **mixed fraction.**



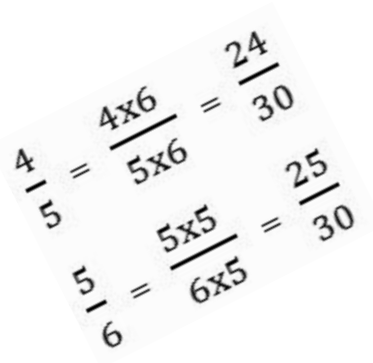
Type of Conversions

Mixed Fraction into Improper Fraction

Improper Fraction into Mixed Fraction



Unlike Fraction into Like Fraction



Converting Mixed Fractions into Improper Fractions

To convert a Mixed fraction to an improper fraction, for the numerator we have to multiply the integer part of the mixed fraction to the denominator of the proper fraction and then add the numerator of the proper fraction and the denominator remains the same as the mixed fraction.

That is, **Improper Fraction =** $\frac{(Integer \times Denominator) + Numerator}{Denominator}$

Converting Improper Fractions into Mixed Fractions

To convert Improper fractions to mixed fractions, we must divide the numerator by its denominator. The quotient obtained is the integer part, a reminder is the numerator and the divisor is the denominator of the required mixed fraction.

That is,**Mixed Fraction =** $Quotient \frac{Reminder}{Divisor}$

Converting Unlike Fractions into Like Fractions

For converting all given fractions to Like fractions we follow the following steps:

1. Write all the denominators of all given fractions.
2. Calculate the **LCM** of all the listed denominators.
3. Now multiply the numerator and denominator of each fraction with the same number so that the denominator changes to the LCM calculated above.
4. Now write all the above-calculated fractions, we can see that all the fractions are like fractions.

Question

Convert $3\frac{11}{15}$ into improper fraction?

Answer:

$$3\frac{11}{15} = \frac{(3 * 15) + 11}{15} = \frac{(45 + 11)}{15} = \frac{56}{15}$$

Simplest Form of Fractions

A fraction is said to be in its simplest form when numerator and denominator have only 1 as common factor.

Reducing Fractions to Lowest Terms

To reduce the fractions we have to find HCF of Numerator and Denominator, then divide Numerator and Denominator with HCF.

Examples:

Reduce the following terms to it's simplest forms.

a. 2/8

HCF of 2, 8 is 2.

$\frac{2\div2}{8\div2}=\frac{1}{4}$, To check if it is the simplest form, find HCF of 1,4

HCF of 1, 4 is 1. So, 1/4 is the reduced fraction.

b. 12/30

HCF of 12, 30 is 6. So divide numerator and denominator with 6, then we get

$\frac{12\div6}{30\div6}=\frac{2}{5}$, Here 2/5 is the reduced fraction.

Question

Reduce 15/81 to its lowest terms and find the correct option?

Answer:

To reduce to it's lowest terms, we have to find HCF of Numerator and denominator and then divide the HCF to both numerator and denominator.

HCF of 15, 81 is 3, so $\frac{15}{81} = \frac{(15/3)}{(81/3)} = \frac{5}{27}$

Question

Reduce 24/72 to its lowest terms and find the correct option?

Answer:

To reduce to it's lowest terms, we have to find HCF of Numerator and denominator and then divide the HCF to both numerator and denominator.

HCF of 24, 72 is 24.

So, $\frac{24}{72} = \frac{(24/24)}{(72/24)} = \frac{1}{3}$

Question

Find the simplest form of 13/104?

Answer:

To reduce to it's lowest terms, we have to find HCF of Numerator and denominator and then divide the HCF to both numerator and denominator.

HCF of 13, 104 is 13, so $\frac{13}{104} = \frac{(13/13)}{(104/13)} = \frac{1}{8}$

Question

Find the simplest form of 55/265

Answer:

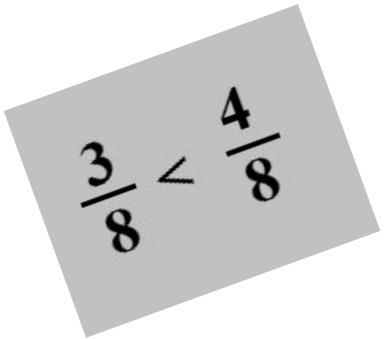
To reduce to it's lowest terms, we have to find HCF of Numerator and denominator and then divide the HCF to both numerator and denominator.

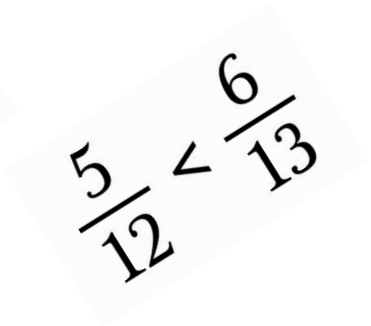
HCF of 55, 265 is 5, so $\frac{55}{265} = \frac{(55/5)}{(265/5)} = \frac{11}{53}$

Comparison of Fractions

To compare two fractions and find out which is greater or smaller, let's classify them into three:

1. **Same denominators but different numerators.**
2. **Same numerators but different denominators.**
3. **Different numerators and different denominators.**





Question

Compare the fractions and fill it with appropriate options(<,>,=)

2/11 ___ 3/11

Answer:

2/11, 3/11

As in the above fractions denominators are same, greater the numerator greater the fraction.

Here, **2/11 < 3/11**

Question

Compare the fractions and fill it with appropriate options(<,>,=)

5/12 ___ 5/23

Answer:

5/12, 5/23

As in the above fractions numerators are same, greater the denominator lesser the fraction.

Here, **5/12 >5/23**

Question

Compare the fractions and fill it with appropriate options(<,>,=)

12/17 ___ 24/34

Answer:

12/17, 24/34

As both numerators and denominators are different, first we convert them to like fractions and then compare them.

LCM of 17 and 34 is 34, so multiply the first fraction with a suitable number to change the denominator to 34,

$$\frac{12\times2}{17\times2}=\frac{24}{34}$$

Now on comparing two fractions we see two fractions are equal to 12/17 = 24/34

Question

Compare the fractions and fill it with appropriate options(<,>,=)

5/8 ___ 8/11

Answer:

5/8, 8/11

As both numerators and denominators are different, we convert them to like fractions and then compare them.

LCM of 8, 11 is 88.

$$\frac{5}{8}, \frac{8}{11} = \frac{5*11}{8*11}, \frac{8*8}{11*8} = \frac{55}{88}, \frac{64}{88}$$

Now on comparing them 55/88 < 64/88 = 5/8<8/11

Question

Subtract the following.

2/5 - 3/10

Answer:

To subtract these fractions we have to change them to like fractions and then subtract the numerators.

LCM of 5, 10 is 10.

$$\frac{2}{5}=\frac{2\times2}{5\times2}=\frac{4}{10}$$

$$\frac{2}{5}-\frac{3}{10}=\frac{4}{10}-\frac{3}{10}=\frac{1}{10}$$

Question

Add the following fractions

1/3 + 1/6 = ?

Answer:

To add these fractions we have to change them to like fractions and then add the numerators

$$\frac{1}{2}=\frac{1\times2}{3\times2}=\frac{2}{6}$$

$$\frac{1}{3}+\frac{1}{6}=\frac{2}{6}+\frac{1}{6}=\frac{3}{6}=\frac{1}{2}$$

You have successfully finished this topic.

Let's spend some time learning **Types of Fractions** also. Click here to learn Type of Fractions, otherwise close this window and choose next topic.

Thanks

You have successfully finished this topic.

Let's spend some time to learn **Conversions** also. Click here to learn **Conversions**, otherwise close this window and choose next topic.

Thanks

You have successfully finished this topic.

Let's spend some time to learn **Simplest Form of Fractions** also. Click here to learn Simplest form of fractions, otherwise close this window and choose next topic.

Thanks

You have successfully finished this topic.

Let's spend some time to learn **Comparison of Fractions** also. Click here to learn Comparison of Fractions, otherwise close this window and choose next topic.

Thanks

You have successfully finished this topic.

Let's spend some time to learn **Addition and Subtraction of Fractions** also.
Click here to learn Addition and Subtraction of Fractions otherwise close this window and choose next topic.

Thanks

You have successfully finished this Chapter.

Your feedbacks are valuable for improving the performance of this "Personalised Adaptive Learning(PAL)" system.

Please **click here** for the feedback form

Thanks

You have completed pre-test assessment questions. Please close this window or go to home page to continue your learning activities.

Thanks