

PREVIEW

This contains
only 20 slides.

Complete slideshow
will be shown only at
the workshop.

*Contact EduHeal Foundation to
conduct workshops in your school.*

EDUHEAL FOUNDATION

• LEARNING FOR LIFE •

103, Taj Apartment, Ground Floor, Ring Road, Near Safdarjung Hospital,
New Delhi - 29. Ph: 011-26197342

website : www.eduhealfoundation.org, e-mail : info@eduhealfoundation.org

Algebra

Algebra is a branch of mathematics that uses mathematical statements to describe relationships between things that vary over time.

Terms In Algebra

- Algebra is a sort of language, and has its own vocabulary.
- Can you say few terms you use when you study algebra.

Few terms in Algebra

- Rational Number
- Irrational Number
- Real Numbers
- Variable
- Expression
- Terms
- Coefficient
- Constant

Rational Number

A number that can be expressed as the quotient of two **integers**. Fractions, mixed numbers, decimals, and integers are all rational numbers, because they may be expressed as a quotient of two integers.

Example :

$$3\frac{1}{4} = \frac{13}{4}, -15 = \frac{-15}{1}, 1.34 = \frac{134}{100}$$

Can you say what is integer?

Irrational Number

Some numbers cannot be written as a quotient of two integers, and these are called **irrational numbers**.

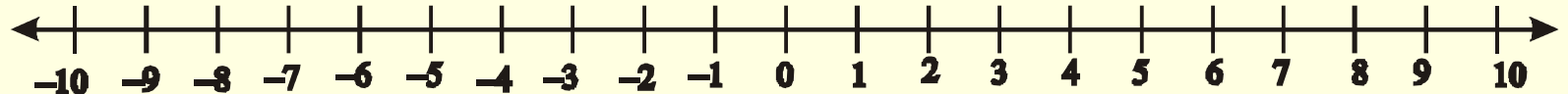
$$\sqrt{2} = 1.4142135\dots$$

$$\pi = 3.14159$$

The decimal form of an irrational number does not terminate or repeat

Real Numbers

The numbers we use to measure real-world quantities, such as length, temperature, or volume, are called **real numbers**. All the rational and irrational numbers make up the set of real numbers. The number line is a model of the set of real numbers.



Variable

A letter that stands for a number in a mathematical expression is called a **variable, because its value can vary.**

In the expression $4n + 7$, n is a variable.

What is expression?

Mathsmatical Expression

A mathematical phrase made up of variable and/or numbers and operations is called an expression.

Here is an example :

$$2ab + 3ab - a$$

What are the variable in this equation?

Terms

In an expression, the terms are the elements separated by the plus or minus signs. In the expression $2ab + 3ab - a$, the terms are $2ab$, $3ab$, and a .

How many terms are there in the expression?

$$4xy + 3x - 5x - 2$$

Coefficient

Coefficient a number that appears before a letter in a term. For example, in the term $2ab$, 2 is the coefficient.

Constant

A term that has only one number and no variables is called a **constant, because its value doesn't vary.**

In the expression $2ab + 3b + 6$, **the number 6 is a constant.**

Algebraic Expressions

- An *algebraic expression* is one or more algebraic terms in a phrase.
- It can include, and operating symbols, such as plus and minus signs.
- It's only a phrase, not the whole sentence, so it doesn't include an equal sign.

eg. of algebraic expression:

$$3x^2 + 2y + 7xy + 5$$

Can you say

How many terms are there in this algebraic expression?

Which number is the constant?

How many variables are there?

How many number coefficients?

Exercise



- **Classify each number** : Integer, real number, rational number, and irrational number. More than one class can apply to each number.

3^5 Real number, integer, rational number

$\sqrt{2}$ Real number, irrational number

2π Real number, irrational number

-4 Real number, integer, rational number

$\frac{5}{7}$ Real number, rational number

Translating Words into Algebra Language

- Let us take some statements in English and translate them in algebra

Statement - 1

- **The sum of three times a number and eight**
- The words "**the sum of**" tell us we need a **plus** sign because we're going to add three times a number.
- A number which is unknown hence variable. It can be x , y , z let's say x .
- Three times a number = $3x$
- So the algebraic expression is $3x + 8$

In this expression, we don't need a multiplication sign or parenthesis. Phrases like "a number" or "the number" tell us our expression has an unknown quantity, called a variable. In algebra, we use letters to represent variables.

Statement - 2

- The product of a number and the same number less 3.
- The words "the product of" tell us we're going to multiply a number times the number less 3.
- In this case, we'll use parentheses to represent the multiplication. The words "less 3" tell us to subtract three from the unknown number.

$$x(x - 3)$$

Statement - 3

- A number divided by the same number less five
- The words "**divided by**" tell us we're going to **divide** a number by the difference of the number and 5. In this case, we'll use a fraction to represent the division. The words "**less 5**" tell us we need a **minus sign** because we're going to subtract five.

$$\frac{x}{x-5}$$

Exercise

Write the expression for

sum of a number and six	number" means a variable. Pick a letter - x is a popular one. "The sum" means you add, and what you add comes next, 6. We can write this expression: $x + 6$
12 times a number less 30	Let's use a different variable, n . Twelve times the number is $12n$. "Less" means you subtract one part of the expression from another. Be careful which part is subtracted from which. One way to write this expression is: $12n - 30$
The sum of the girl's age and half the boy's age	there are two variables here, because we don't know the ages of the girl or the boy. Let's call the girl's age x and the boy's age y . The word "sum" means we are adding the two terms. The boy's age needs be divided in half before it gets into the expression. Hence this expression will be $x + \frac{1}{2}y$