



18

Algebraic Symbols

By studying this lesson, you will be able to,

- identify known terms, unknown terms and variables.

18.1 Symbols used in maths

There are many symbols which are used in mathematics that you are aware of. For example, 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9 are ten symbols that you know very well. These symbols of the Hindu Arabic System are defined as digits. All the numbers are written using these ten digits.

Several numerals that can be written using only the digits 1 and 2 are given below. For example, twenty two is denoted by 22 and two hundred and twenty one is denoted by 221.

1, 11, 12, 21, 22, 111, 112, 121, 122, 211, 212, 221, 222

Several other symbols which are used in mathematics are given below.

Mathematical operation	Symbol
Addition	+
Subtraction	–
Multiplication	×
Division	÷

Mathematical expressions can be written using symbols such as 1, 2, 3, +, –, ×, ÷, =.

For example, the statement that thirteen is obtained by adding five to eight can be expressed using symbols as $8 + 5 = 13$.

The statement “three twos is six” can be expressed as $2 \times 3 = 6$ and “two threes is six” can be expressed as $3 \times 2 = 6$ using symbols.



Example 1



Let us find the total number of litres of milk that are purchased during a week by a household which purchases two litres of milk each day.

The solution to this problem can be expressed as $2 \times 7 = 14$ using symbols.

That is, the quantity of milk purchased during a week by the household is 14 l.

Symbols are used when solving a problem with the knowledge of mathematics. In this case, it is necessary to translate statements which have been expressed in words into mathematical statements using symbols before the problem is solved.

18.2 Symbols used to denote known and unknown terms

We know that there are seven days in a week. This is also written as “7 days in a week”.

In this example, the symbol 7 has been used to express the fact that a week has seven days. This is a constant number which we know. Therefore it is defined as a known term.

A known constant value can be expressed using a symbol as above. These constant values are called known terms.

In mathematics, a constant value which is known, that is a **known term**, is expressed by a number.

Suppose a certain household buys the same amount of milk each day. If this amount is not known, we cannot express it using a number. Such constant values which are not known are defined as **unknowns**.





An unknown term in a mathematical expression is most often represented by a simple letter of the English alphabet. Accordingly, since the amount of milk purchased each day is an unknown constant value, we can denote it using the letter a .



Look at the way Nimal and Sita show us how many olives they each have in their hand.

The number of olives that are in Sita's hand can be written using the numerical symbol "3". It is a known number. However we cannot say definitely how many olives there are in Nimal's hand. This is an unknown constant value. That is, it is an unknown term.

Accordingly, let us take the number of olives that are in Nimal's hand to be b . Note that we may use any other letter we like as well, instead of b .

The symbols used to denote unknown terms as above are algebraic symbols.

Several instances when algebraic symbols are used to denote unknown constants are given below.

- ❖ The length of your classroom is l metres.
- ❖ The number of books in your school library is n .
- ❖ The height of the flag pole is h metres.

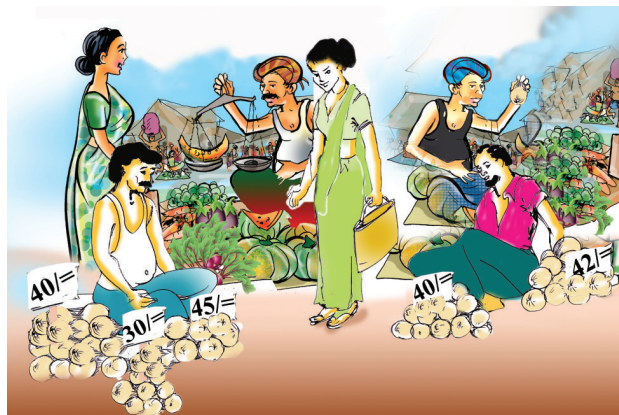


Exercise 18.1

- (1) (i) Write down in the 2nd column of the following table whether each of the expressions given in the table states a known constant or an unknown constant.
- (ii) In the 3rd column write down its value by digits if it is a known constant and a suitable algebraic symbol if it is an unknown constant.

Expression	Known/ Unknown	
❖ The number of days in January		
❖ The number of books in Nimal's school bag		
❖ The number of millilitres in one litre		
❖ The number of words in the Grade 6 mathematics textbook.		
❖ The number of times you took a breath yesterday.		

18.3 Variables



It should be clear to you from the above figure, that there are coconuts of various prices to be sold at the market. Therefore, since the selling price of a coconut does not take a fixed value, we say that the price of a coconut is a **variable**.



Such variables are denoted using English letters such as x, y, z, \dots . These too are **algebraic symbols**.

Example 1

The daily revenue of a certain shop is Rs x .

The distance a vehicle travels during an hour is y km.

The distance travelled by a vehicle on one litre of petrol is x km.

The number of days in the month of February is n .

Exercise 18.2

- (1) Write down whether each of the following is a constant value or a variable.
 - (i) The number of players in a netball team
 - (ii) The number of bananas in the first comb of a cluster of bananas
 - (iii) The time taken for a jet to travel from the Katunayake International airport to the New Delhi airport
 - (iii) The number of sides of a square
 - (v) The number of centimetres in a metre
 - (vi) The number of limes in one kilogramme of limes
 - (vii) The distance travelled by a vehicle on one litre of petrol
 - (viii) The time taken by a student to travel from home to school
 - (ix) The daily rainfall
 - (x) The price of one pound of gold in rupees
 - (xi) The price of one US dollar in rupees
 - (xii) The number of days in a year
 - (xiii) The daily attendance of the children in a particular school

Summary

- Constant values which are known are defined as known terms.
- Constant values which are not known are defined as unknown terms. (Unknowns)