

Algebra (बीजगणितं) is a branch of mathematics that deals with symbols and rules for manipulating them. [In Sanskrit, algebra is also called बीजगणितं, which means the science of seeds or unknowns¹](#). Algebraic characters are the symbols used to represent numbers, variables, operations, and relations in algebra. For example, in the equation

$$x + 2 = 5$$

x

is an algebraic character that represents an unknown number.

To write algebraic characters in Sanskrit, you can use the Devanagari script, which is the script used to write Sanskrit and many other Indian languages. [Devanagari script has 47 primary characters, consisting of 14 vowels and 33 consonants²](#). You can use these characters to write numbers, variables, and operations in algebra. For example, you can write the equation

$$x + 2 = 5$$

in Devanagari script as:

$$क + २ = ५$$

Here,

क

is a consonant that can be used to represent the variable

x

. You can also use other consonants or vowels to represent different variables, as long as they are not confused with numbers or operations. For example, you can write the equation

$$y - 3 = 2x$$

as:

$$य - ३ = २क$$

Here,

य

is another consonant that can be used to represent the variable

y

. You can also use diacritical marks, such as dots, dashes, and lines, to modify the characters and create new symbols. For example, you can write the equation

$$z^2 + 4z - 12 = 0$$

as:

$$ज़^२ + ४ज़ - १२ = ०$$

Here,

ज़

is a modified consonant that can be used to represent the variable

z

. The dot above the character indicates that it is pronounced with a voiced fricative sound, similar to the English letter

z

. You can also use the dot below the character to indicate that it is pronounced with a retroflex sound, similar to the English letter

r

. For example, you can write the equation

$$w^3 - 6w + 9 = 0$$

as:

$$व्र^३ - ६व्र + ९ = ०$$

Here,

व्र

is a modified consonant that can be used to represent the variable

w

. The dot below the character indicates that it is pronounced with a retroflex approximant sound, similar to the English letter

To write operations in algebra, you can use the Devanagari numerals and symbols that correspond to the arithmetic operations. For example, you can use the following symbols to write addition, subtraction, multiplication, division, and equality:

+ = युतः

- = क्षयः

\times = गुणः

\div = भागः

= = समं

[These symbols are derived from the first letters of the Sanskrit words for the operations, such as युतः \(yutah\) for addition, क्षयः \(ksayah\) for subtraction, गुणः \(gunah\) for multiplication, भागः \(bhāgah\) for division, and समं \(samam\) for equality³.](#) You can also use other symbols, such as brackets, parentheses, and fractions, to write more complex expressions and equations. For example, you can write the expression

$$\frac{x + 2}{y - 3}$$

as:

$$\frac{\text{क} + २}{\text{य} - ३}$$

Here, the horizontal line indicates the fraction, and the brackets indicate the numerator and denominator. You can also use parentheses to indicate the order of operations, such as in the expression

$$(x + 2)^2 - (y - 3)^2$$

:

$$(\text{क} + २)^२ - (\text{य} - ३)^२$$

Here, the parentheses indicate that the terms inside them are to be squared first, and then subtracted.

To do calculations in algebra with Devanagari script, you can follow the same rules and methods as in algebra with Latin script. You can use the symbols and characters to write equations and expressions, and then manipulate them according to the algebraic principles. For example, to solve the equation

$$x + 2 = 5$$

, you can write it in Devanagari script as:

$$क + २ = ५$$

Then, you can subtract 2 from both sides to isolate

$$x$$

:

$$क + २ - २ = ५ - २$$

$$क = ३$$

This means that the value of

$$x$$

is 3. You can check your answer by substituting it back into the original equation:

$$३ + २ = ५$$

$$५ = ५$$

This is a true statement, so the solution is correct.

I can show you how to do a simple integration question in Devanagari script. First, you need to know how to write the integration symbol, which is \int . [According to the web search results¹²](#), there is no standard way to write this symbol in Devanagari script, but one possible way is to use the character ल (la) with a horizontal line above it, like this:

$$\overline{\text{ल}}$$

You can also use other characters or symbols that look similar to the integration symbol, as long as they are not confused with other mathematical symbols or Devanagari letters. For example, you could also use the character श (śa) with a horizontal line above it, like this:

$$\overline{\text{श}}$$

Or, you could use the character ष (ṣa) with a horizontal line above it, like this:

$$\overline{\text{ष}}$$

Using this rule, you can solve the question by substituting

n

with 2, and simplifying the expression. You can write the solution as:

$$\overline{\text{ल}} क^२ \text{गुणः} क \text{भागः} = \frac{क^{२+१}}{२+१} \text{युतः} स$$
$$= \frac{क^३}{३} \text{युतः} स$$

This means that the answer is

$$\frac{x^3}{3} + C$$

in Latin script, or

$$\frac{क^३}{३} \text{युतः} स$$

in Devanagari script.

Some other mathematical symbols in Devanagari script are:

- The symbol for square root, which is $\sqrt{\quad}$. You can write this symbol in Devanagari script by using the character व (va) with a horizontal line above it, like this:

$$\overline{\text{व}}$$

For example, you can write the square root of 2 as:

$$\overline{\text{व}} २$$

- The symbol for infinity, which is ∞ . You can write this symbol in Devanagari script by using the character अ (a) with a horizontal line above and below it, like this:

$$\overline{\text{अ}} \underline{\text{अ}}$$

For example, you can write the limit of a function as x approaches infinity as:

$$\lim_{क \to \overline{\text{अ}} \underline{\text{अ}}} f(क)$$

- The symbol for pi, which is π . You can write this symbol in Devanagari script by using the character प (pa) with a dot above it, like this:

$$\dot{\text{प}}$$

For example, you can write the area of a circle as:

$$\dot{\text{प}} \text{ र}^2$$

where

र

is the radius of the circle.

- The symbol for sigma, which is Σ . You can write this symbol in Devanagari script by using the character स (sa) with a horizontal line above and below it, like this:

$$\overline{\text{स}} \underline{\text{स}}$$

For example, you can write the sum of the first n natural numbers as:

$$\overline{\text{स}} \underline{\text{स}}_{\text{इ}=1}^{\text{न}} \text{इ} = \frac{n(n+1)}{2}$$

where

इ

is the index of summation and

न

is the upper limit.

These are some examples of mathematical symbols in Devanagari script. [You can find more symbols and their meanings in the web search results¹²³](#).

Devanagari script is not only used to write numbers and algebraic symbols, but also to write mathematical terms, concepts, and formulas in Sanskrit and other Indian languages. For example, you can write the Pythagorean theorem as:

$$\text{त्रिकोणस्य विशालकोणभुजयोः वर्गयोः योगः त्रिकोणस्य कर्णवर्गसमः}$$

[which means “the sum of the squares of the two sides of a right-angled triangle is equal to the square of the hypotenuse”¹](#)

You can also write the quadratic formula as:

$$\text{क} = \frac{-\text{ब} \text{युतः} \pm \overline{\text{व}} \text{ब}^2 \text{क्षयः}}{2\text{अ}}$$

[which means “x equals the opposite of b plus or minus the square root of b squared minus four times a times c, all over two times a”²](#)

You can also write the trigonometric functions as:

$$\text{\text{ज्या}} = \frac{\text{\text{लम्ब}}}{\text{\text{कर्ण}}}$$

$$\text{\text{कोटि}} = \frac{\text{\text{कोटिलम्ब}}}{\text{\text{लम्ब}}}$$

$$\text{\text{स्पृष्ट}} = \frac{\text{\text{कोटिलम्ब}}}{\text{\text{कर्ण}}}$$

[which mean “sine equals the opposite over the hypotenuse”, “cosine equals the adjacent over the hypotenuse”, and “tangent equals the opposite over the adjacent”³](#)

These are some examples of how Devanagari script can be used to write mathematics in Sanskrit and other Indian languages. There are many more uses and applications of Devanagari script in mathematics, such as writing geometry, calculus, logic, and number theory. You can find more information and examples in the web search results .