



## Shreemad Bhagavat Geeta From Mathematical Perspectives

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### Article Info

### Abstract

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*This article is based on the message of Shreemad Bhagvat Geeta, a significant and popular text within the Hindu epic, Mahabharat. An attempt has been made to convey its meaning with the help of this article. In fact, this is a try to analyze the scripture from the lens of mathematics so that the mathematics community can benefit from it. Inside the article, the quantification process of our practical life endeavors and some methods related to mathematics teaching are discussed. No mathematical formulas and calculations are included here but formulas for solving practical life problems are mentioned.*

**Keywords:** *Mana, japa, sloka, yoga, yajna*

### Introduction

*Shreemad Bhagvat Geeta* is one of the most popular Hindu scriptures which is regarded as the conclusion of all *Vedas* and *Upanisads* of Hinduism (Paramahansa, 2010). It was written by the most popular Sage Vedabyasa, who is known as the writer of four Vedas too. It is believed that *Shreemad Bhagvat Geeta* was written over five thousand years ago. It consists of 18 chapters and 700 *slokas*. It has mainly talked about three *yogas* that are essential for an individual to live a balanced life. The first six chapters are about *Karma yoga* (*yoga* of action), middle six chapters shed light on *Bhakti yoga* (*yoga* of devotion) and remaining ones highlight the importance of *Jnana yoga* (*yoga* of knowledge).

*Geeta* is presented in the form of a dialogue between Krishna (incarnation of Lord Vishnu according to Hindu Mythology) and Arjun (son of Pandu), the great warrior of *Mahabharata* battle (Nicholson, 2016). Arjun is introduced as one among the *Pandava* (the five sons of *Pandu*). *Geeta*, not only from spiritual point of view but also from the point of view of practical life, is equally important. The crux of this holy scripture is that we need to know ourselves and control our emotions as per the necessity so as to live a healthy and prosperous life. Moreover, we need to have a stable *mana* (driving force of our sense organs). That is to say, unstable *mana* cannot do any specific and noticeable work that can lead oneself towards the goal, instead brings instability and miseries in life. In *Geeta*, our body has been shown as a complex system and is compared with the Universe. So that we can remain attached with the nature and nature has provided us the basic things to survive, in absence of which no life is possible like air, water, fire etc.

In this article, a try has been made to analyze *Shreemad Bhagvat Geeta* from the perspective of mathematics. Mathematics is a subject of self-enthusiasm and self-creativity. (Gupta and Rani, 1998) It demands a combination of different techniques in order to grasp its real concept. In this regard, the message conveyed by means of this article can be useful for the students and teachers of mathematics. Like the process of learning other subjects, the first step that students need in learning mathematics is a strong desire to assimilate with the different concepts of mathematics. Arjun, in the role of a student in *Geeta*, is found to be very much curious to know each activity meaningfully from his teacher Krishna. Actually, it is shown that Arjun is a great warrior but his mind is not stable in the battle field. The entire *Geeta* is related to how Krishna changes the attitude and thinking of Arjun about the battle that was going to start. After the teacher teaches him different chapters of *Geeta*, he realizes that his duties and responsibilities hold a greater significance than his personal emotions and attachments. Formulae of mathematics help us in solving mathematical problems but the formulae of *Geeta* help us in living a healthy and prosperous life. Therefore, I have made an effort to highlight these

principles under the heading formula for living a healthier life by balancing inner and outer (i.e., physical and psychological) states of life.

चञ्चलं हिमिनःकृष्ण प्रमाथबिलवदृढम् ।

तस्याहं नगिरहं मन्ये वायोरवि सुदुष्करम् ॥ (Chapter 6, *Sloka* 34)

Arjun tells his teacher Krishna that it is as difficult to control the activities of *mana* as to stop the flow of wind. Krishna agrees with his point of view and suggested that practice is needed to control *mana* (controller of our senses). In learning mathematics too, there is a great importance of practice. According to Throndike, 'Practice makes a man perfect'. However, the effectiveness of practice largely depends upon the teacher.

Although *Geeta* is regarded as a spiritual text, there are many useful events that should be taken in consideration for practical life purposes, especially in the process of teaching and learning. *Geeta*'s knowledge and ideas are quite popular throughout world.

### Methodology of study

Within qualitative research, the present paper utilized document analysis to analyze, collect and interpret data (Adhikari & Magarai, 2022) from the *Shreemad Bhagwat Geeta*. This study is based on the result of the message given by *Shreemad Bhagwat Geeta*. In this article, I have tried to present *Geeta*'s version in regard to mathematical perspective under the following themes:

Method of generalization of a Concept, Method of Demonstration of a Concept, Method of *Japa* and Formulae for Daily Life. Each theme is elaborated below in order to make connections with mathematics.

### Method of generalization of a concept (Chapter 10, *Slokas* 21-39)

Krishna explains the concept of existence of God everywhere by giving the examples related to the existing things in this Universe. It means the concept of God has been generalized by means of the already existing things (living or non-living). This resembles to the concept of inductive method because it proceeds from known to unknown, from specific to general and from examples to the general rule. Some of the examples are presented below :

आदित्यानामहं वषिणुरज्योतषिां रवरिशुमान्। मरीचरिमरुतामस्मनिक्षत्राणामहं शशी ॥

I am Vishnu among the 12 sons of Aditi

I am sun among all bright things

वेदानां सामवेदोऽस्मि देवानामस्मि वासवः। इन्द्रयिणां मनश्चास्मि भूतानामस्मि चेतना ॥

I am *Sama Veda* among four *Vedas*

I am *mana* (driving force of our senses) among senses

I am Consciousness in the body

रुद्राणां शङ्करश्चास्मि वितितेशो यक्षरक्षसाम्। इन्द्र वसूनां पावकश्चास्मि भेरुःशखिरणामहम् ॥

I am Sumeru among all peaks

पुरोधसां च मुख्यं मां वदिधि पार्थ बृहस्पतम्। सेनानीनामहं स्कन्दःसरसामस्मिसागरः॥

I am Brihaspati (identified as the main pandit of all *Gods*, Jupiter as a planet) among all *Pandits*

I am Skanda (regarded as supreme commander of *God's* Army) among all warriors

I am Sea among all reservoirs of water.

महर्षीणां भृगुरहं गरिमस्म्येकमक्षरम्। यज्जानां जपयज्जोऽस्मि स्थावराणां हिमालयः॥

I am Bhrigu among all Great Sages

I am *Japa Yajna* among all *yajnas*

I am Himalaya among all stable hills

अश्वत्थःसर्ववृक्षाणां देवर्षीणां च नारदः । गन्धर्वाणां चतिरथःसदिधानां कपलिो मुनिः ॥

I am Peepal among all trees

I am Narad(regarded as the messenger of God) among all *Deva Rishis*

उच्चैश्वरसमश्वानां वदिधिभाममृतोद्भवम् । ऐरावतं गजेन्द्राणां नराणां च नराधपिम् ॥

I am *Uchchaih Shrava*(special holy horse) among all Horses

I am *Eirabat*(special holy elephant) among all Elephants

I am King among all Humans

आयुधानामहं वजरं धेनूनामस्मि कामधुक् । प्रजनश्चास्मि किन्दरपःसर्पाणामस्मि वासुकिः ॥

I am *Bajra*(reagarded as Lord Indra's weapon) among all Weapons

I am *Kamadhenu*(special holy cow) among all Cows

I am Kamadeva(holy power to produce sexual desire) for creating the new generations

अनन्तश्चास्मि नागानां वरुणो यादसामहम् । पत्विणामर्यमा चास्मि यिमःसंयमतामहम् ॥

I am *Sheshnag* among all Snakes

I am Yamaraj (God of death) among all Rulers

प्रह्लादश्चास्मि दैत्यानां कालःकलयतामहम् । मृगाणां च मृगेन्द्रोऽहं वैनतेयश्च पक्षिणाम् ॥

I am Pralhad(Lord Vishnu's greatest devotee) among all Demons

I am time for Counting

I am Lion among all Animals

I am *Garuda* (the mount of Lord Vishnu) among all Birds

पवनःपवतामस्मि रामःशस्त्रभृतामहम् । झषाणां मकरश्चास्मि सिरोतसामस्मि जिह्नवी ॥

I am Air for making the things refreshed

I am Crocodile among all Reptiles

I am *Bhagirathi Ganga* (holy river) among all Rivers

सर्गाणामादरिन्तश्च मध्यं चैवाहमर्जुन । अध्यात्मवदिया वदियानां वादःप्रवदतामहम् ॥

I am Logic for making the high level Dialogues

मृत्युःसर्वहरश्चाहमुद्भवश्च भवषियताम् । कीर्तिःश्रीर्वाक्च नारीणां स्मृतिरिमेधा धृतिःकिष्मा ॥

I am Death for the Destruction

I am the Cause of creation for all living and non-living things

बृहत्साम तथा साम्नां गायत्री छन्दसामहम् । मासानां मार्गशीर्षोऽहमृतूनां कुसुमाकरः ॥

I am *Mangshir* (Nov-Dec) among all months

I am Spring among all the Seasons

द्यूतं छलयतामस्मत्तेजस्तेजस्वनिमहम् । जयोऽस्मद्व्यवसायोऽस्मत्सित्त्वं सत्त्ववतामहम् ॥

I am Victory for all Winners

वृष्णीनां वासुदेवोऽस्मत्पाण्डवानां धनञ्जयः । मुनीनामप्यहं व्यासःकवीनामुशना कविः॥

I am Dhananjaya (Arjun) among all Pandavas

I am Vedabyasa among all *Munis*

दण्डो दमयतामस्मन्नीतरिस्मजिगीषताम् । मौनं चैवास्मद्गिह्यानां ज्ञानं ज्ञानवतामहम्॥

I am Punishment for Exploiters

I am policy for Successful persons

I am the Absolute knowledge for all *Pandits*

यच्चापसिखभूतानां बीजं तदहमर्जुन । न तदस्तविनि यत्स्यान्मया भूतं चराचरम् ॥

I am the Cause of evolution of all living beings

In this way, he gave the examples related to the human beings, trees, animals, birds, Himalayas, rivers, snakes, trees, warriors, fishes, poets, etc. which have existence in the nature. Finally, the concept has been generalized as 'In all valuable and brightened things, I am present'. The interaction between the teacher Krishna and the student Arjun for the generalization of a concept 'God is everywhere in this Universe and the whole Universe is the creation of him' is relevant for teaching different abstract concepts of mathematics. This is the best way for the realization of the Universality of the God. But what I realize from this presentation is that this is the best example that has been adopted in *Geeta* for the generalization of an abstract fact of the existence of the *God*.

### Method of Demonstration (Chapter 11, *Slokas* 9-34)

In chapter 10, the existence of God in different substances has been explained by Krishna. But his student is not fully convinced by the general sayings only. Therefore, the teacher has taken the help of method of demonstration for the meaningful understanding of verbal statement given by him. During the demonstration, Krishna shows his *Divya swaroop* (his divine form).

एवमुक्त्वा ततो राजन्महायोगेश्वरो हरः। दर्शयामास पार्थाय परमं रूपमैश्वरम् ॥ (Chapter 11,

*Sloka* 9)

According to the verses, Arjun sees everything present in Krishna, which he had told earlier. This process convinces Arjun that everything that exists in this universe is within Krishna and Krishna himself is existence. With the help of this, Arjun was convinced that everything the teacher told previously were true. This is an example of variety of teaching methods and their proper order to be used for the meaningful learning of a concept. Because if the method of teaching is defective, it is likely to create distaste for the subject (Kumar,1993). This is very much important in mathematics teaching.

### Method of *Japa* (Chapter 10, *Sloka*-25)

In *Geeta*, Lord Krishna has told that *Japa Yajna* is the best *Yajna* for human (यज्जानां जपयज्जोऽस्मिन्...). *Yajna* means some offerings or devotion so that some particular desire is fulfilled. In the simple understanding, *Japa* is the process of repetition of same word or a group of words again and again. But, according to *Geeta*, *Japa* does not mean mere repetition of words. It has been defined as the method to internalize the characteristics of different *Gods/Goddesses* into the real life. This approach is useful to teach mathematics or to understand mathematical formulae not only by their repetition but understanding its characteristics in a greater detail. As a result, there should not be confusion in its remembrance. For example, by simply rote learning, student can memorize the area of the cylinder as  $2\pi r(r+h)$ . But, if it is remembered by knowing the characteristics of the real cylinder, it becomes more meaningful and permanent. That is to say, if the student is able to identify the types of surfaces of the cylinder, then he/she can never forget the formula. The message of *Japa* provided by *Geeta* is exactly the same. *Japa* method of teaching mathematics has been discussed in the article among the

academic community for discussion.

### Formulae for daily life

I found *Geeta*'s knowledge practical for the mathematics teachers and tried to share it thinking that it will be helpful for our community and my concern is that we need to realize those in the classroom also.

### Formula for Patience

सुखदुःखे समे कृत्वा लाभालाभौ जयाजयौ । ततो युद्धाय युज्यस्व नैवं पापमवाप्स्यसि ॥ (Chapter 2, *Sloka* 38)

*Geeta*'s message tells us that we need to maintain patience in happiness and sadness. This is the formula for patience. Patience is one of the major requirements for mathematical problem solving because mathematical problem solving requires comprehension of the problem, use of proper technique and formulae along with accuracy in calculation (Johnson, 1976). During the teaching/learning process of mathematics, we teachers need to try to develop patience among the students so that they don't get disappointed while solving different mathematical problems.

### Triguna principle

त्रैगुण्यवषिया वेदा नसित्त्रैगुण्यो भवारजुन । नरिद्वन्द्वो नतियसत्त्वस्थो नरियोगक्षेम आत्मवान् ॥ (Chapter 2, *Sloka* 45)

'Tri' means three. There are three qualities present in all human beings. They are *sattwa*, *raja* and *tama*. People with *sattwa* predominance can serve more to others in comparison to the remaining two. Therefore, the quality of human is also quantified in *Geeta*.

### Dedication towards the profession

श्रेयान्स्वधर्मो वगुणःपरधर्मात्स्वनुष्ठितत् । स्वधर्मे नधिनं श्रेयःपरधर्मो भयावहः ॥ (Chapter 3, *Sloka* 35)

It is mentioned that we need to love our profession with due respect . It is the message of this *sloka* is that we need to treat our profession as our absolute duty and should not be diverted from it (Sahni, 2017).

### Division of work

चातुर्वर्ण्य मया सृष्टं गुणकर्मवभागशः । तस्य कर्तारमपिमां वदिधयकर्तारमव्ययम् ॥ (Chapter 4, *Sloka* 13)

Classification of work according to the nature of individual has been discussed very well in *Geeta*. This division as mentioned is not based on any caste or ethnicity or religion but according to the nature of work of an individual. We can apply the division of work principle in mathematics classroom according to the level of the students.

### Formula for the control of *mana*

As discussed earlier, *mana* is defined as the controller of our sense organs in *Geeta*. There is a discussion for the control mechanism of *mana* between Krishna and Arjun.

As per Krishna, we can control it by means of practice. It has also been restated in Chapter 12, *Sloka* 9. (अथ चित्तं समाधातुं न शक्नोषमिय स्थिरम् । अभ्यासयोगेन ततो मामच्छाप्तुं धनञ्जय ॥) So, practice is the main weapon to have full control over all senses according to *Geeta*, which seems to be practical and scientific also.

### Types of *Bhakta*

चतुर्विधा भजन्ते मां जनाःसुकृतीनि ऽरजुन ।

आर्तो जजिज्ञासुरर्थार्थी ज्ञानी च भरतर्षभ ॥ (Chapter 7, *Sloka* 16)

*Shreemad Bhagawat Geeeta* has classified *bhakta* (a religious devotee) into four categories. First are those who worship God for materialistic pleasures; Second category devotees are those who worship God, seeking freedom from their sorrows. Third category devotees are the enthusiastic ones who try to know the true form

of God with high level of curiosity. Those people who can solve each and every enthusiasm with high level of thoughts fall under the fourth category. This is also symbolic for all of us that we need to identify our students categorically so that we can handle them as per their interest and potentials.

### Formula for sacrifice of unnecessary things

त्रविधिं नरकस्येदं द्वारं नाशनमात्मनः। कामःक्रोधस्तथा लोभस्तस्मादेतत्त्रयं त्यजेत् ॥ (Chapter 16, Sloka 21).

According to *Geeta*, we need to remove the three things *kama* (uncontrollable desire), *krodha*(anger) and *lobha* (greed) from our life to live a healthier life.

### Formula of existence of five

इन्द्रयाणिपिराण्याहुरिन्द्रियिभ्यःपरं मनः। मनसस्तु परा बुद्धरियो बुद्धेःपरतस्तु सः ॥ (Chapter 3, Sloka-42)

Our body is made up of five components: earth, water, air, sky and fire from the religious aspect. We need to have necessary control over our sense organs: eye, ear, skin, taste and nose. There is a relationship between body, sense organs, *mana*, *Buddhi* (intelligence) and *aatma* (soul); which are also five in number. The interesting fact explained in *Geeta* is that senses have control over our body, *mana* has control over the senses, *Buddhi* has control over *mana* and *aatma* has control over the *Buddhi*.

### Three stages of life

अव्यक्तादीनिभूतानिव्यक्तमध्यानिभारत । अव्यक्तनिधिनान्येव तत्र का परदिवना ॥ (Chapter 2, Sloka 28)

*Geeta* has quantified our life in three stages: before birth, during our survival in this world and after death. It is explained that there is no existence of life before birth and after death. We get bound into relationships with others only during life and there are no relationships and obligations before or after life. Therefore, there is no reason why we should be worried on the demise of dearest and nearest person.

### Three types of *Punya* (Virtue)

These are symbolic for us. We can sacrifice our weaknesses so that we teachers have mental peace and we can present in a friendly way in the classroom. This can change the attitude of the teachers as well as that of students eventually. *Yajna*(sacrifice), *Tapa*(austerity) and *Daan*(charity) are mentioned as the three types of *punyas*.

Justifications of *Geeta* are also systematic. For example,

अन्नाद्भवन्तिभूतानिपर्जन्यादन्नसम्भवः।

यज्जाद्भवतिपर्जन्यो यज्जःकर्मसमुद्भवः ॥ (Chapter 3, Sloka 14)

In order to justify the importance of *Yajna*, Krishna tells that grains are necessary for human; the production of grains is possible by water and water is possible through the clouds made by the smoke of the holy fire. The same is applied in order to justify the existence of numbers in mathematics. As Kronecker says “Integers are gift of God and the rest is the invention of men” (Burton, 1999). For a function to be derivable, continuity is must, for a function to be continuous, limit is must and for the existence of limit, we need to take the help of numbers. This justifies the importance of numbers in mathematics.

Another principle of *Geeta* is the concentration of the driving force of our senses, i.e., *Mana*. This is also necessary to be controlled while solving mathematical problems. If we have less concentration on problem solving, there is less chance that we reach to the solution.

### Time count in *Geeta*

As we all know one day consists of 24 hours. In *Shreemad Bhagvat Geeta*, one day of Lord Brahma has been mentioned as 8640 million years.

Another principle I want to mention as explained in *Geeta* is that there are two ways of being connected with the *God*: one is to perform the duties and responsibilities as a normal person residing with the family and continuing the job and devotion towards the *God*. And the other is to be disconnected with the family members

and responsibilities and sacrifice the whole life for the *God* and in the service of others. In the above mentioned two types, the former ones are regarded as better than the second one. The same principle we can apply in our teaching to the students because if students get or want to be detached from mathematical problems, they cannot do or solve mathematical problems. On the other hand, if they remain attached with the problems of mathematics, then they can learn and understand mathematics in a better way.

## CONCLUSION

*Geeta* has quantified the duties and responsibilities of an individual. The qualities are quantified in a systematic way. Especially, the method of realization of an abstract concept, i.e., the existence of *God* has been explained in an inductive way. This is one of the methods for teaching mathematics. In the same way, the method of demonstration has also been discussed. Moreover, some of the rules we need to realize and adopt in our lives are presented in the scripture. In this way, *Geeta* presents the techniques which are applicable to the teaching/learning of mathematics and other subjects also.

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