

What is Calculus?

Calculus is the language of engineers, scientists, and economists. The work of these professionals has a huge impact on our daily life – from your microwaves, cell phones, TV, and car to medicine, economy, and national defense.

British Scientist Sir Isaac Newton (1642-1727) invented this new field of mathematics. ‘Calculus’ is a Latin word, which means ‘stone.’ Romans used stones for counting. For the counting of infinitely smaller numbers, Mathematicians began using the same term, and the name stuck.

Though it was proved that some basic ideas of Calculus were known to our Indian Mathematicians, Newton & Leibnitz initiated a new era of mathematics. There are a large number of applications of calculus in our daily life. It can’t be possibly illustrated in a single view. I’m trying to describe them shortly here.

What is the use of calculus in computer science?

In **Computer Science**, **Calculus** is **used** for machine learning, data mining, **scientific computing**, image processing, and creating the graphics and physics engines for video games, including the 3D visuals for simulations. **Calculus** is also **used** in a wide array software programs that require it.

Is calculus used in programming?

This **calculus programming** language is usually **used** in various other program languages such as Java. In Java, a famous **programming** language **used** by various corporations such as IBM, TCS, and Google, the API **Calculus** is commonly **used** to solve equations and programs involving **calculus**.

What is the use of differentiation and integration in computer programming?

Data analysis and prediction for business **applications**. Modeling software for things like biological systems, meteorology and climatology, engineering **applications**, etc. Machine learning and artificial intelligence, including such things as natural language processing, pattern recognition, etc.

Application in Engineering

1. An Architect Engineer uses integration in determining the amount of the necessary materials to construct curved shape constructions (e.g. dome over a sports arena) and

also to measure the weight of that structure. Calculus is used to improve the architecture not only of buildings but also of important infrastructures such as bridges.

2. In Electrical Engineering, Calculus (Integration) is used to determine the exact length of power cable needed to connect two substations, which are miles away from each other. Space flight **engineers** frequently **use** calculus when planning for long missions.
3. Space flight engineers frequently use calculus when planning for long missions. To launch an exploratory probe, they must consider the different orbiting velocities of the Earth and the planet the probe is targeted for, as well as other gravitational influences like the sun and the moon.

Application in Medical Science

1. Biologists use differential calculus to determine the exact rate of growth in a bacterial culture when different variables such as temperature and food source are changed.

Application in Physics

1. In Physics, Integration is very much needed. For example, to calculate the Centre of Mass, Centre of Gravity and Mass Moment of Inertia of a sports utility vehicle.
2. To calculate the velocity and trajectory of an object, predict the position of planets, and understand electromagnetism.
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Application in Statistics

1. Statisticians use calculus to evaluate survey data to help develop business plans for different companies. Because a survey involves many different questions with a range of possible answers, calculus allows a more accurate prediction for the appropriate action.

Application in Research Analysis

1. An operations research analyst will use calculus when observing different processes at a manufacturing corporation. By considering the value of different variables, they can help a company improve operating efficiency, increase production, and raise profits.

Application in Graphics

1. A graphics artist uses calculus to determine how different three-dimensional models will behave when subjected to rapidly changing conditions. It can create a realistic environment for movies or video games.

Application in Chemistry

1. It is used to determine the rate of a chemical reaction and to determine some necessary information of Radioactive decay reaction.

Let's take a look at some other examples.

- Credit card companies use calculus to set the minimum payments due on credit card statements at the exact time the statement is processed by considering multiple variables such as changing interest rates and a fluctuating available balance.
- Doctors and lawyers use calculus to help build the discipline necessary for solving complex problems, such as diagnosing patients or planning a prosecution case.
- The field of epidemiology — the study of the spread of infectious disease — relies heavily on calculus. It can be used to determine how far and fast a disease is spreading, where it may have originated from and how to best treat it.

For most professions, this topic is very important. So, this is why you can't dismiss it as just another subject. Despite its mystique as a more complex branch of mathematics, it touches our lives each day, in ways too numerous to calculate. You can find tips from our experts [here](#) to become super at calculus.