# Comprehensive Calculus Resources And Where To Find Them

Calculus is one of the leading causes of anxiety among students. It reminds us of long differential equations, hefty integrals, and mind-boggling equations.

While many math students seem to have had a bad experience with calculus, it doesn't have to be the way it is.

Most people struggle with the subject because of weak bases and foundations. However, since calculus forms a vital part of almost every college major, we must eliminate the negative connotations around it.

To help make calculus easier, students can resort to countless learning aids and resources – some online and some print – which break down the abstract concepts and help them conceptualize the problems.

Therefore, we've compiled a list of the most helpful calculus resources for students.

$$F : I \to \mathbb{R}, \quad x \mapsto \int_a^x f(t)\,dt$$
$$\int_a^b f(x)\,dx = F(b) - F(a)$$
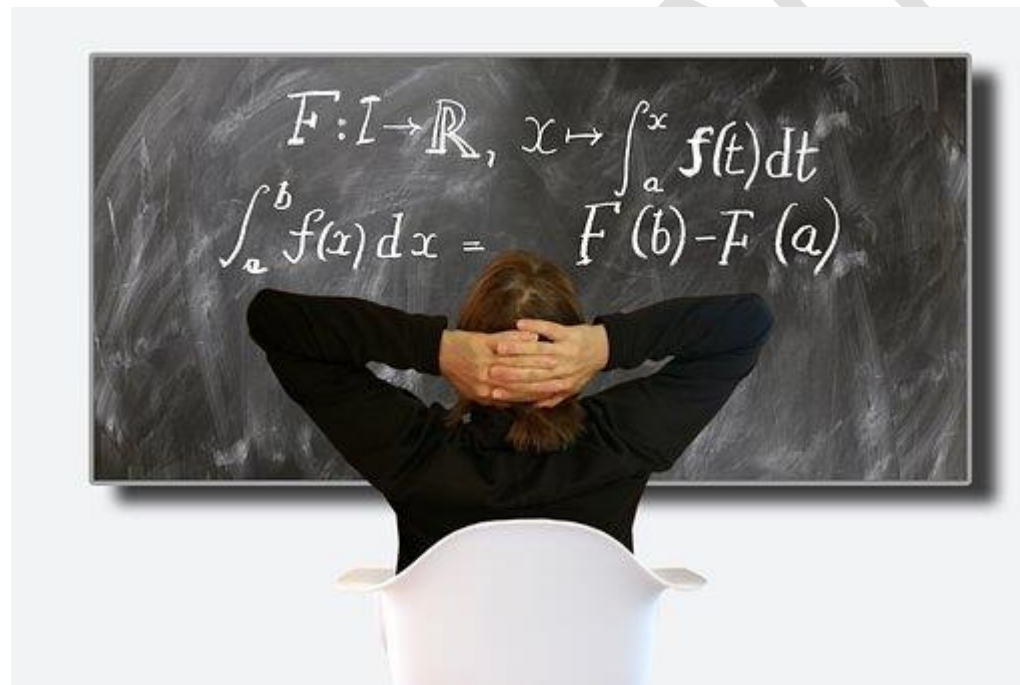
Alt-text: A person in a black shirt looking at an integral calculus equation on a blackboard

Meta-description: Both differential and integral equations form a core part of college-level calculus. Before moving onto more advanced concepts, students should first master the calculus bases, which include simple differentiation and integration (Pixabay)

Online Resources

Khan Academy

One of the internet's greatest success stories, [Khan Academy](#), has become ubiquitous with online learning.

This non-profit, run by Salman Khan, features more than 6,000 video tutorials for just about every topic, including calculus.

The good thing about Khan Academy is that it features 15-minute short videos and includes a wide range of calculus bases, from differential calculus to integral calculus.

On-site navigation is also excellent; once on the website, you can easily switch topics. This convenience makes it easy to use for younger and older people.

MIT's Open Courseware

MIT's MOOC, the Open Courseware site, was one of the first online resources to put up lecture videos and self-help resources for calculus students, including:

- Notes
- Homework
- Exams

While several other competitors have surfaced since then, MIT's Open Courseware site is the most veritable platform for learning calculus and other STEM-related subjects.

Users can find video lectures on calculus courses here, along with other advanced studies in arithmetic theory.

Following MIT's lead, many other universities have also started uploading their lectures online for a wider audience.

Therefore, you no longer need to fret about how to find a calculus tutor when you have personalized calculus lectures from MIT at your disposal.

Paul's Online Math Notes

This is an online site started by Paul Denkins – a math professor at Lamar University – and is easily one of the best free resources for calculus students online.

The site features a vast collection of practice problems and examples. It also has complete solutions with links that take users to the respective topics in the course when the answer calls for it.

The layout of the site and the solution-centric approach makes it an excellent resource for calculus learners.

In addition, the site also features sections on related concepts, like pre-calculus and algebra. As a result, Paul's Online Math Notes almost feels like you're learning with a <mark>private calculus tutor.</mark>

Alt-text: An equation involving limits on a whiteboard

Meta-description: It can be challenging for us to quantify the concept of infinity, but when we're working with calculus, especially limits, we must incorporate both negative and positive infinity into our equations (Source: Pixabay)

Calculus Guide Books

Mot everyone is comfortable with the shift of education from paperback to digital, especially older people and experienced professors.

For everyone in the same boat, here are some monumental pieces of written work on calculus:

How to Ace Calculus: The Streetwise Guide By Abigail Thompson

This book is an excellent guide for when you're looking for a calculus learning resource in print. It's got some unique content to get you through your calculus course with flying colors.

For instance, it offers calculus exam tips that you wouldn't find in any other resource book for calculus.

Furthermore, you can check out the initial few pages on the website to review the book before buying it in print.

Everyday Calculus By Oscar Fernandez

We've all heard of how applicable and relevant calculus is in real life. But we rarely ever get to see it being used, and most calculus problems involve obscure events like calculating the acceleration of rockets.

That plays into the distrust many students have with math, and they end up finding it hard to relate to calculus.

However, Everyday Calculus brings typical and real-life examples of calculus problems to students. The book does a brilliant job at showing students the innumerable implications of calculus in their everyday lives and makes calculus relatable for the readers.

Some unique examples from the book include problems that talk about how coffee cools down while linking it to derivates to show the calculus hidden around us.

Calculus Applets

Several websites feature interactive demonstrations that help users visualize math problems. These applets allow users to:

- Change parameters
- Drag points and functions
- See real-time visualizations of calculus

This combination makes it easier to understand how calculus works and applies to the world around us.

Some examples of calculus problems are better to understand through visual modeling rather than textual explanations.

These may include questions that call for increasing the number of sides on a polygon until it converges to a circle.

Many of these applets work on mobile devices as well. However, it is wise to check their technical specifications and compatibility as some computers and devices might block them due to security settings.

Alt-text: A sketch of Isaac Newton

Meta-description: While most people are aware of Isaac Newton's famous apple story, which ultimately led to his discovery of gravity, most of us are unaware that he also pioneered calculus, being the first mathematician to do so in the 1660s (Source: Pixabay)

Tips For Succeeding At Calculus

Calculus is known to scare students. However, it's not the overall course content that's the problem, but rather the foundational concepts that give students headaches.

This is why math teachers stress the importance of reviewing past exam papers and understanding the concepts during class.

Therefore, when attempting calculus, it's essential to take things one step at a time and understand the definitions and rules.

Let's simplify calculus and see how students can adopt small tips to make their calculus classes easier:

Know The Terminology Of Calculus

You must take the time to learn the definitions, as is routine with any math topic you're working with.

Calculus forms a separate branch of mathematics, and students must learn the definitions for each concept within calculus, such as understanding the application of:

- Limits
- Derivates
- Integrals

Often, one calculus problem can feature many different tasks and can be phrased in several ways.

Without knowing the definitions and the terminology, you won't be able to understand how to tackle the question.

One Step At A Time

We learn calculus in a very rigid order at school, starting with limits, derivatives, series, and so on. But if you're wondering why that is so, it's because each topic builds upon the last.

And so, while preparing on your own, it's better to focus on one concept at a time. Then, you should focus on reinforcing new concepts by linking them to what you learned previously.

Keep in mind that most calculus books and study guides generally start with limits. That is because limits are the foundation of calculus; derivates, integrals, and series depend on them.

When studying any calculus topic, don't memorize but rather try to understand the concepts behind them.

Know Your Symbols

Calculus, like algebra, is full of symbols, variables, and obscure Greek letters. A layperson reading a calculus leaflet would almost assume it to be a code or a foreign script!

To master calculus, it is crucial to understand the equations. Many times, an entire calculus problem can be composed of symbols. Without knowing the meaning of each symbol, you won't learn anything.

But at the same time, when a calculus problem features too many symbols, you should know when to drop them to clear up space. Again, this ties in with knowing your symbols well.

Additionally, when you know your variables well – such as an algebraic equation of 2x + 6x= 16 – you would know how to sidestep each variable during calculations.

We say this because most students get confused with the extra symbols that make up calculus. Unfortunately, this misunderstanding can cost them valuable grading points.

For most examples of calculus equations that feature differentiation, you can take the d/dx after the initial step.

It might seem entirely arbitrary to mention this, but if you don't address the minor details, you might end up ruining your answer.

Learn To Work With Infinity

Infinity is one of those terms you might have heard in elementary school when referencing vast, uncountable numbers. After all, who can go on counting forever?

But in calculus, you will be working with this term quite often. Although it's hard to imagine the concept of infinity, it is used in calculus to describe a value that becomes extremely.

Knowing how to incorporate infinity can help you out with many topics in calculus, especially limits and integrals.

Visualize In 3D

In calculus, you will have to work on problems that involve area, volumes, and revolutions, especially in integration. Start thinking in three-dimensional space to help you visualize better.

It is apparent that you cannot complete the whole problem by only sticking to visualization, but it will surely help in some of the critical steps.

You don't have to be a 3D artist to visualize volumes of revolution for calculus. However, as long as you can make 3D figures, you can understand what the question asks.

Work With The Rules

You must work with the rules when you're doing math. Otherwise, you'll end up with entirely different values and figures compared to what the question asks of you.

In calculus, the rules you must be mindful of include:

- The chain rule
- The quotient rule
- The u-substitution
- The integration by parts rule

Without knowing these specific techniques and rules of the game, you won't succeed at calculus.

Ignore The Resources And Study with A Private tutor

If you're struggling with calculus and still not getting anywhere, maybe it's time for you to get some secondary help.

In that case, a private calculus tutor can help break down some of the abstract concepts for you and make the subject easier for you.

To find the best calculus tutors in your vicinity, make a profile on Superprof. Then, connect with a tutor, set up an initial lesson to decide your schedule, and start your calculus lessons pronto!
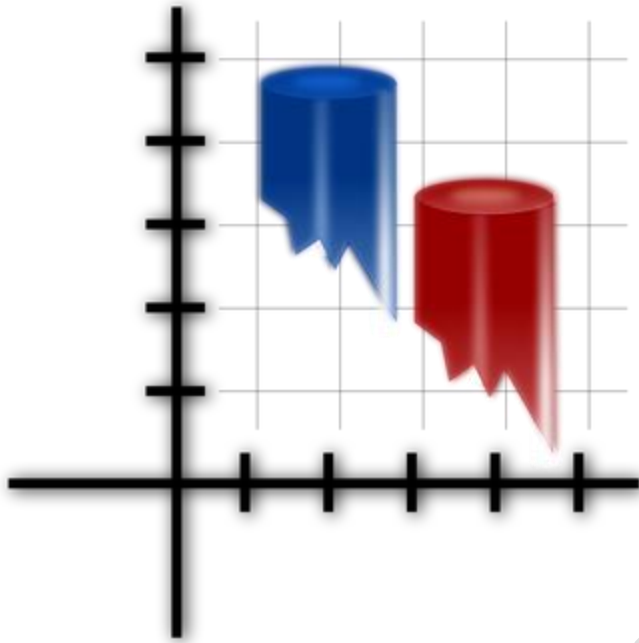
Alt-text: A graphical representation of a volume of rotation through integration

Meta-description: While differentiation is used to calculate the rate of change, integration can be used to calculate the area and volume of the rotation of geometrical objects. (Source: Pixabay)

Alt-title: Comprehensive Calculus Resources And Where To Find Them | Superprof

Meta-description: Calculus is the bane of students across the states, but it becomes much easier with the right tools. Read on to find out where you can find the best learning resources for calculus