

01: Introduction to Calculus

What is Calculus

Calculus is the study of how things change. Many problems have some element of continual change which requires more than Algebra, Arithmetic, Geometry, or Trigonometry.

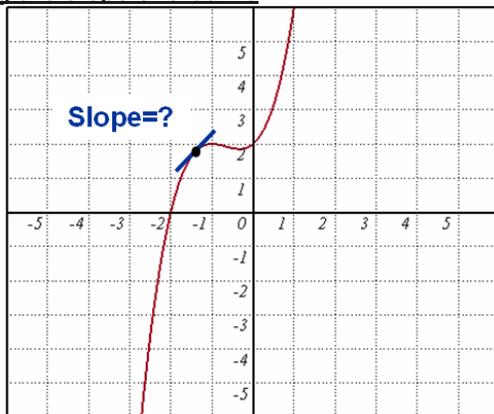
3 General Steps

- In general, Calculus problems involve three steps:
1. Breaking the problem down into infinitesimally small pieces.
 2. Analyzing and solving each individual piece.
 3. Adding the results of each individual piece to get an estimate about the overall problem.

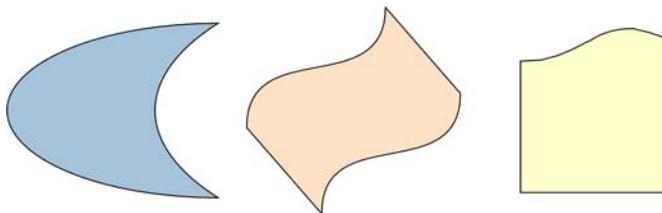
Typical Problems in Calculus

Some of the common types of problems in Calculus involve:

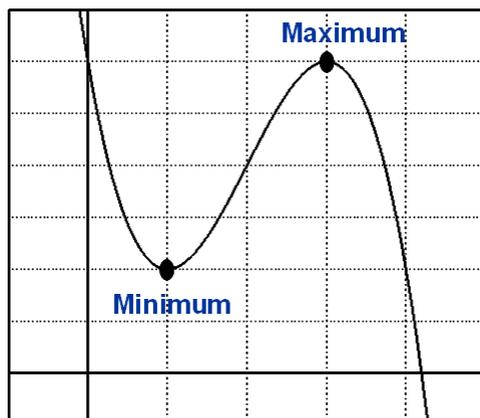
Finding the Slope of a Curve



Finding the Area of Irregular Shapes



Finding the Maximum or Minimum of a Function



Topics in Calculus

The general topics included in Calculus are:

- Limits
- Differentiation
- Applications of Differentiation
- Integration
- Applications of Integration

Study Tip: Know Prerequisite Knowledge

Mathematics in general is a cumulative subject. Calculus is no exception. Knowing the prerequisite material will make Calculus much easier.

Prerequisite Material Includes:

- Algebra
- Geometry
- Trigonometry
- Graphing

Study Tip: Read Your Math Book

Remember that your math book is there to help you understand the content:

- Read your book carefully.
- Write down questions as you have them.
- Work through any steps that your book may skip over.

Study Tip: Ask Questions

If you have trouble understanding the material, ask questions.

Study Tip: Study With a Group

Your classmates are trying to learn the same material that you are. Take advantage of it.

- Organize a study group.
- Compare lecture notes.
- Work homework together.

Study Tip: Get Something Out of the Group

Remember that you will be tested individually. When studying with a group, be sure to get something out of it.

- Be an active member of the study group.
- Work some exercises alone.

Study Tip: Focus on the Concepts

Everything may not make sense all at once. Focusing on the concepts and how the procedures fit into the big picture will help you succeed in Calculus.

How to Use This Cheat Sheet: These are the keys related this topic. Try to read through it carefully twice then recite it out on a blank sheet of paper. Review it again before the exams.