

## **WELCOME to CALCULUS II**

Math 152, Calculus II, is a continuation of Math 151 and follows a similar structure:

Concepts: What are integrals (informal and formal meanings)?

Applications: What do we use integrals for?

Techniques: How do we calculate integrals?

In Calculus I we took a “simple” geometric idea (the slope of a tangent line) and built a rich structure of applications and techniques. In Calculus II we will take another “simple” geometric idea (the area under a curve) and will build another structure of applications and techniques. And we will see that the ideas of “tangent slope” and “area” have a beautiful connection (Thank you Newton and Leibniz.).

**So welcome back for more calculus.**

## **WELCOME to CALCULUS I**

Calculus is the mathematics of CHANGE and almost everything in our world is changing.

Calculus is among the most important and useful developments of human thought, and, even though it is over 300 years old, it is still considered the beginning and cornerstone of modern mathematics. It is a wonderful and beautiful and useful set of ideas and techniques

You will see the fundamental ideas of this course over and over again in future courses in mathematics, the sciences (physical, biological and social) as well as in economics, engineering and others.

But calculus is an intellectual step up from your previous mathematics courses. Many of the ideas are more carefully defined, and they have both a functional and a graphical meaning. Some of the algorithms are more complicated, and in many cases you will need to decide on the appropriate algorithm to use. And there is a huge variety of applications, too many to be able to discuss each one in class in detail.

### **What this means for you, the student.**

Probably more than in your previous mathematics classes you need

- \* to think about the concepts as well as the techniques,
- \* to think about the patterns as well as the individual steps,
- \* to think about the meaning of the concepts and techniques in the context of particular applications,
- \* to think about how the ideas and techniques apply to functions given by graphs and tables as well as by formulas, and
- \* to spend enough time (1 to 2 hours each day) doing problems to sort out the concepts and to master the techniques and to get better and more efficient with the algebra skills that are vital to success.

Sometimes all this mental stretching can seem overwhelming, but stick with it (and do lots of problems). It can even become fun.

**So welcome to calculus.**