**AB Calculus**

**Advanced Placement Summer Institute**

**Online – Carleton College**

**June29 – July 3, 2020**

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## **Illinois Mathematics and Science Academy**

Overview:

This workshop will take a detailed look at the major topics of the Course Description for AB Calculus. For each topic, we will do problems and activities to help instructors deepen their understanding of calculus. Relationships between fundamental concepts will be stressed.We will clarify expectations of the AP program by examining past exam questions. Through this work, instructors will be asked to examine and then strengthen their own instructional methods to help students understand calculus.

While examining the specific content pieces listed below, we will look carefully at the new Course Description and the Mathematical Practices. Participants will be asked to examine how their own teaching meshes with the new emphases and expectations.

Technology will be used throughout the workshop to support exploration and understanding. During the week, I encourage participants to use Moodle to discuss many other important issues of teaching AB Calculus – textbooks, prerequisites, the AP audit, assessment, dealing with homework, technology, and whatever else that arises. (I will be happy to set up forums for specific topics.)

Attendees are expected to fully participate. This includes doing problems and activities as asked, and verbally contributing to group discussions online.

### **Monday**

 Basic plan, expectations, etc.

 AP Calculus CED, Mathematical Practices, Big Ideas, and general philosophy

(to be continued throughout)

 Measuring Speed

 An interesting graph

 Approximating derivatives

 Definition of a derivative

**Tuesday**

More on graphs

 Limits

 Continuity and the Intermediate Value Theorem

 Calculating Derivatives

 Mean Value Theorem

**Wednesday**

 L’Hospital’s Rule

 Measuring Distance

 Properties of integrals

 Accumulated Area

 Definition of an integral

**Thursday**

 Fundamental Theorems

 Applications of integrals

 Lots of old AP problems!

**Friday**

 Differential Equations –

 Introduction

 Slope Fields

 Separable equations

 Lots more old AP problems