**Description of Presentations:** The AP Summer Institute in Calculus AB will provide intensive training to high school teachers and prospective teachers of AP Calculus AB. The institute will cover designing, implementing and teaching an AP course in Calculus AB. Participants will become familiar with the expectations and structure of the College Board’s AP Calculus AB test. Teachers will receive information on text and source materials, strategies, techniques, and methods which will be of value in beginning an AP Calculus AB course or in enhancing the teaching of an established AP Calculus AB course. Activities will include:

- Creating an AP program in Calculus AB
- Review of topics on the AP Calculus exam
- Review of past AP examinations and scoring rubrics
- Guidance for teaching critical concepts
- Developing successful AP assignments

**Course Outline**

**Monday: am:** Introductions
- Prerequisite Math and calculator skills
- AP course general discussion: Course set up, enrollment, text selections
- Course content, sample syllabi, course audit
- AP Test in Calculus: Structure of the text, skills emphasize, scoring

**pm:** Functions, Graphs, and Limits
- Analysis of graphs
- Limits of functions
- Asymptotic and unbounded behavior
- Continuity as a property of functions

**Tuesday: am:** Tangent Lines and Local Linearity
- Differential Calculus:
  - Concept of the derivative
  - Derivative at a point
  - Derivative as a function
- Techniques of differentiation

**pm:** Applications of the derivative:
- Slope of tangent line/curve at a point
- Instantaneous rate of Change, related rates and optimization problems
- Three Important Theorems

**Wednesday: am:** Antidifferentiation and Integral Calculus:
- Introducing antiderivatives
- Interpretations and properties of definite integrals
- Fundamental Theorem of Calculus
Functions defined by definite Integrals
Accumulation Functions

**pm:** Higher derivatives
Applications of derivatives
Practice lessons with several short stories

**Thursday: am:** Antidifferentiation and Integral Calculus
Antiderivatives
Interpretations and properties of definite integrals
Fundamental Theorem of Calculus

**pm:** Practice lessons

**Friday: am:** Indefinite integrals and application of integration
Techniques of integration
Applications of integrals

**pm:** Review of major issues and unanswered questions