

Mathematics 136, Section 3 – AP Calculus, Section 4  
Discussion 1–Matching Formulas to Graphs  
September 9, 2003

*Background*

We have been reviewing the basic functions studied in calculus. Today, in a group discussion exercise, we will conclude this initial part of the course. Given a graph, we will try to determine a reasonable formula that might yield a graph with that shape. An additional goal will be to introduce you to a way of working in a classroom context you may not have experienced too often before in mathematics classes – *collaborative learning*. Some suggestions:

- Try to tackle the questions below *as a group*, not individually. For instance, don't be shy about throwing out partial ideas or suggestions how to proceed. That's *the point* of doing things this way, and you're "in this" together.
- The goal is for *everyone* to contribute to, and fully understand the group's results. So if you think you "see" something, your job is to *explain* it to the other members of the group. On the other hand, if you don't understand something someone else says, your job is to *ask questions* until either you are convinced, or you are able to show the other person that he or she was mistaken.
- Choose one or more "scribe(s)" within your group to keep a clean written record of what you do. The end product of the exercise will be one set of solutions to the problems below, which you will turn in as a group. I will assign one grade for each group's solutions.

*Discussion Questions*

Find a possible formula for each of the functions defined by the graphs in problems 6-17 in the Review Problems for Chapter 1 on page 49 of our text.

**Important Directions:** No calculators, graphing or otherwise, may be used during the class discussion(!)

*Some suggestions*

- Start by trying to determine what *family* of functions fits the properties of each graph the best (i.e. is it the graph of a *linear* function, an *exponential* function, a *polynomial* function, a *trigonometric function*, a *rational* function?)
- Once you have decided what type of function you are dealing with, you may also need to determine constants, and *shift and/or scale* the basic functions we have studied to get a graph like the one shown.
- NOTE: There are many different correct answers for each of these, but some correct answers are also *very complicated*. There are relatively "simple" formulas that will work in each case!

*Due:* In class, Wednesday, September 10.