



# Integration and Differentiation

9-27-2006





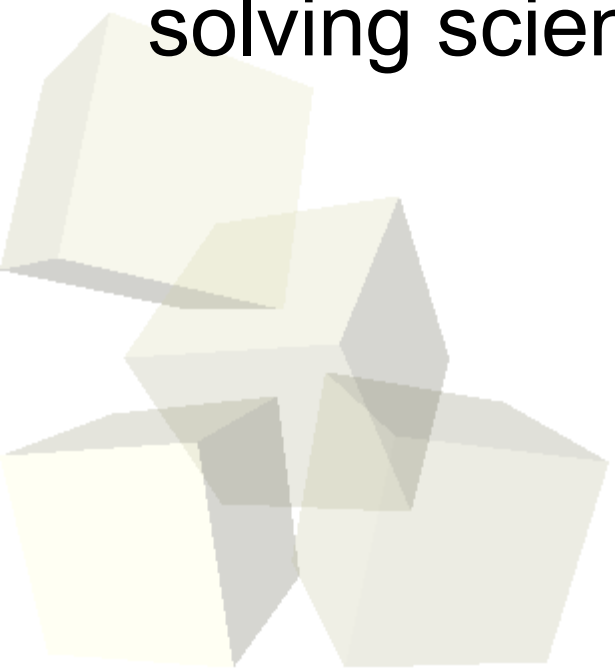
# Opening Discussion

- What did we talk about last class?
- Let's talk about the project for this class. What do you want to do? I can come up with projects from a number of different fields, but we need to pick something.





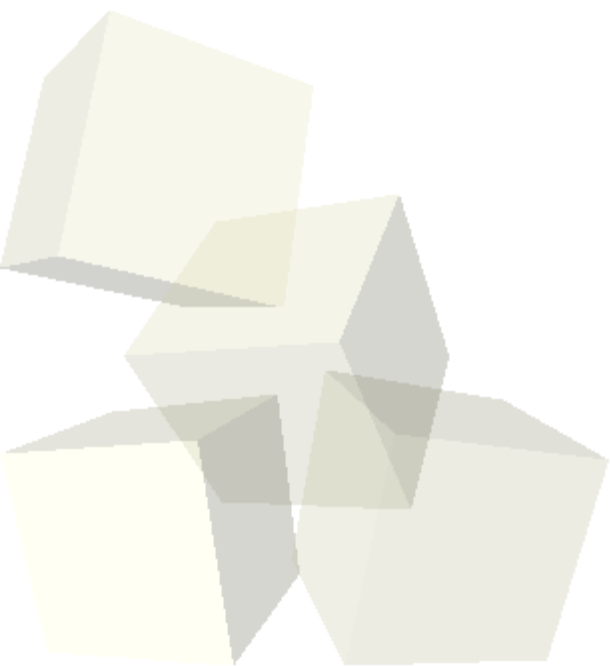
- What functions do we use for integrating in Matlab? What can you tell me about how these functions work?
- Let's write code that will integrate some fairly simple functions. Note the difference in what we have to pass to the different integration functions.
- Where would we want to use integration when solving science problems?





# Integration in 2-D

- What do we use for doing integration in 2-dimensions?
- What is the meaning of 2-D integrations? Where is this useful in science?

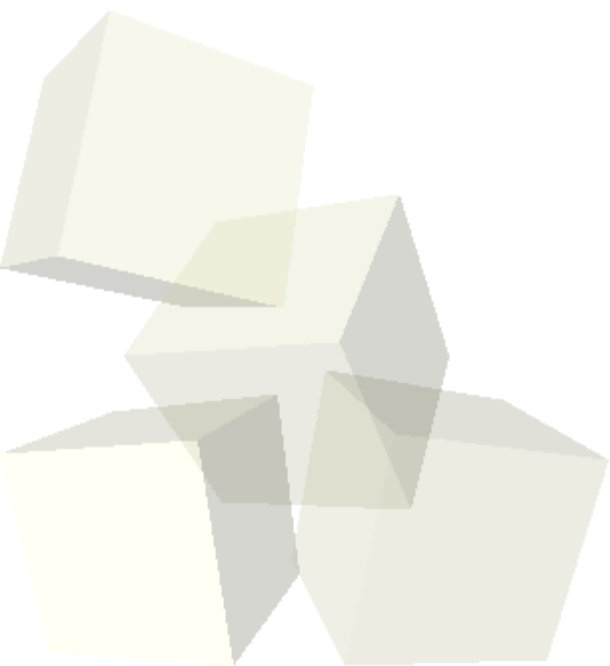




- Numeric differentiation is something that is generally frowned upon. The reason is simply that difference methods are not well behaved, especially when dealing with noisy data from an experiment. If you have that type of data you should do some type of fitting and take a derivative of the fit.
- What are we supposed to use to take numerical derivatives in Matlab?
- Why is a central difference so much more accurate than a forward or backward difference?



- Do you know what the meaning of a gradient is? Matlab has a built in function that will calculate a gradient for grid data.





# Closing Comments

- You have about a week for assignment #5.

