

# Merit Worksheet #20, 3/13/09

## Part I: A Group Review

I will assign your group a number. Based on your number, take 20 minutes to prepare a presentation to the class about the topics assigned to your group. Try to have as many people as possible involved in the presentation of your answers, and try to be both accurate and entertaining in your answers. Don't feel like you have to, but do feel like you can, include things like the following:

- drawings (diagrams, comic strips, abstract art, etc.)
- skits
- jingles or slogans
- dramatic readings of the text
- interpretive dance
- examples (real-life or dry as dust)
- references to current events, music, TV or movies
- etc.

Just keep it appropriate, and keep it correct. Let me know if you have any questions. Have fun!

**Group 1: Differential equations and sequences** Make a presentation, 10 minutes or less, teaching the class key life lessons about the following things.

- What a differential equation is, and what a solution is.
- The differential equation  $y' = ky$ .
- Sequences, and what it means for a sequence to converge or diverge.
- Different properties sequences can have.

**Group 2: Basic series facts** Make a presentation, 10 minutes or less, teaching the class key life lessons about the following things.

- What series are, what partial sums are, and what it means for a series to converge.
- Things about series that are surprising when you first see them.
- Different types of series—their names, and what they look like.
- Series for which we can figure out the sum exactly.

**Group 3: The Integral Test and Comparison Tests** Make a presentation, 10 minutes or less, teaching the class key life lessons about the following things.

- The Integral Test, and why it conceptually makes sense.
- The Comparison Test, the concept(s) behind it, and mistakes you can make while trying to use it.
- The Limit Comparison Test and the concept(s) behind it.

**Group 4: Alternating Series** Make a presentation, 10 minutes or less, teaching the class key life lessons about the following things.

- What an alternating series is.
- Why we like alternating series.
- How to tell if an alternating series converges, and how to tell approximately what it converges to.

**Group 5: Absolute convergence and the Ratio and Root Tests** Make a presentation, 10 minutes or less, teaching the class key life lessons about the following things.

- What absolute convergence is, and why we care about it.
- The difference between absolute convergence, conditional convergence, and divergence.
- The Ratio Test and Root Test—what they are, what they tell you, when they work/don't work, and any conceptual ideas behind them.

## Part II: Class discussion

Here are the sections the test on Monday will go over. What questions do you have?

- 7.1 Modeling with Differential Equations
- 8.1 Sequences of Real Numbers
- 8.2 Infinite Series
- 8.3 The Integral Test and Comparison Tests
- 8.4 Alternating Series
- 8.5 Absolute Convergence and the Ratio Test.

## For next time

The exam is on Monday from 11 to 12:50 (our normal class time) in **164 Noyes Lab**.

## Quotes of the day

Pi Day is tomorrow, so here are a few about  $\pi$ , from [www.piday.org](http://www.piday.org):

“Im like  $\pi$ ...irrational, but well-rounded.” — Anonymous

$\pi$  to  $i$ : “Get real!”

$i$  to  $\pi$ : “Be rational!”

If, in a circle, a line  
Hits the center, and runs spine to spine,  
And the line's length is  $D$   
The circumference will be  
 $D$  times 3.14159.

A great palindrome: “I prefer pi.”