

Advanced Time Management for Markers

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The Marking

What do we mark in math?

How is that different from marking in humanities?

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Computations

Proofs

Homework, quizzes, exams...

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More objective

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Only one right answer

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~~Only one right answer~~

Before you start

If you are marking for someone (or if someone is marking for you):

Logistics:

- What will I be marking?
- Will I record the marks? If so, how?
- Will I have anything to do with the CourseSpaces page?
- When/how will I collect materials to be marked?
- When/how will I return marked materials?

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Protect student privacy
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- Will I record the marks? If so, how?
Protect student privacy
- Will I have anything to do with the CourseSpaces page?
Check access and permissions
- When/how will I collect materials to be marked?
- When/how will I return marked materials?

Before you start, cont.

Solutions:

- Will I need a copy of the textbook? If so, where can I get it?
- Will you provide solutions?
- Will you provide grading guides or rubrics?
- If not, would you like to see/approve my solutions and rubrics?
- What sorts of mistakes are the most important in your course?
- What should I do if I suspect students are collaborating?
- What should I do if I suspect students are plagiarizing?

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Are they allowed/supposed to? What are the guidelines?
- What should I do if I suspect students are plagiarizing?

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Time management:

- How many students are in the course?
- How long do you expect I will spend on each assignment/midterm/etc.?
- May I post combined feedback on CourseSpaces or equivalent?
- Will correct solutions be provided to the students?

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- Will correct solutions be provided to the students?
If so, just point out errors – don't correct them.

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- For you: “weird” solutions, special exceptions, examples.
- For them: common feedback.

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Pace yourself. Find a friend.

Rubrics

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Mathematical correctness

- 5 Complete and correct
- 4 Minor errors in notation or calculations, which do not affect whether the solution method is applicable. This includes undefined notation when it does not produce confusion.
- 3 One significant error that affects the solution, or multiple minor errors. This includes undefined notation when it does produce confusion.
- 2 Multiple significant errors, or a false assumption that changes the problem.
- 1 Some ideas, but no significant progress.
- 0 No solution, or ideas that will not lead to a solution.

Rigor and communication

- * A joy to read
- 3 Good and clear solution. Might contain minor formatting errors or egregious spelling and punctuation errors.
- 2 Fully justified solution, but hard to follow: out-of-order sentences, marginal notes, follow-the-arrow “organization”, etc.
- 1 Incomplete proof, or proof is very hard to follow.
- 0 No English words on the page.

Total points possible: 8

Sample rubric from Math 4281 (Modern Algebra), Fall 2013, University of Minnesota

Interpreting pre-set grading guides

- *This table isn't formatted right, but the content is correct.*
Should I deduct all 3 of the points assigned to that table?
- *This analysis uses the right keywords, but doesn't use them correctly.*
Should I award the 2 points for each keyword?
- *The student dropped a coefficient partway through balancing the equation, which made it a lot easier to solve.*
Should I award all 5 points for this problem, or just some?

Activity: worksheet

Homework problem: Evaluate the following indefinite integral:

$$\int \sin^2(x) dx$$

Grading guide:

- 1 point for notation (don't drop “ dx ” and remember “ $+C$ ”, etc.)
- 1 point for trig identity
- 2 points for integrating
- 1 point for correct algebra

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- Postpones carpal tunnel syndrom
- Can be edited
- Gives students more feedback
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- Postpones carpal tunnel syndrom
- Can be edited
- Gives students more feedback
- Can be reused
- ... Can help prevent capricious marking
- ... Requires students to participate

Example: narrative

The most popular error this week was to cite the Alternating Series Test to prove that the series diverges. Remember that the AST can only prove convergence, not divergence. If you did this, it was a **serious reasoning error** – understanding what the various series tests do (and don't) say is very important for this section of the course.

Students who tried to use the AST to prove divergence were actually using the k th term test for divergence. This means that their work might look really similar to a student who earned full marks, because all of the limits will look the same. Citing the wrong theorem is a “small” error in that it takes about two inches of writing – but it is significant.

Another popular error was computing the limit incorrectly. This was often a **serious computation error**, but in some cases the limit computation was basically correct and just had a **minor computation error** in the coefficient. Some students tried to apply a comparison or limit comparison test. These tests will not work on this series, however, and so those solutions were usually **incomplete** or had **serious reasoning errors** (if you made a mistake that made the test appear to work).

Example: laundry list

- ❶ Cited the Alternating Series Test to prove that the series diverges. Remember that the AST can only prove convergence, not divergence. If you did this, it was a **serious reasoning error** – understanding what the various series tests do (and don't) say is very important for this section of the course.
- ❷ Computed limit incorrectly, in a significant way (example: $\lim_{n \rightarrow \infty} \frac{2^n n^n}{e^n} = 0$). **serious computation error**
- ❸ Computed limit incorrectly, in a minor way (example: $\lim_{n \rightarrow \infty} \frac{(2n)^n}{e^n} = \lim_{n \rightarrow \infty} \frac{2n^n}{e^n} = \infty$) **minor computation error**
- ❹ Tried to apply a comparison or limit comparison test, and was (correctly) unable to finish. **incomplete**
- ❺ Tried to apply a comparison or limit comparison test, and made a significant computation or reasoning error that made it look like the test worked. **serious error**. Examples:
 - ▶ (Would provide some based on students' solutions)

Technology

Notes to myself:

- Typed feedback
- CourseSpaces (TeX filter)
- iPad grading guides
- Good to know: <http://www.wolframalpha.com> and <https://proofwiki.org>

Teaching Dossier & TA Fundamentals

Marking Artifacts:

- Rubric
- Grading Guides
- Combined Feedback
- Rubric/Syllabus pair: feedback aligned with course goals

Next Time