

# Mastery-Based Exams Are Self-Evidently Better Than Traditional Exams

Austin Mohr

Department of Mathematics  
Nebraska Wesleyan University

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# What Is It?

- Clear Content Objectives
- Credit Only For Mastery
- Multiple Chances With Complete Forgiveness



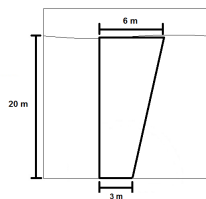
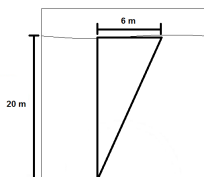
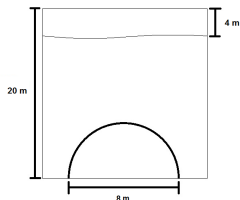
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# What Is It?

## Clear Content Objectives

### Hydrostatic Force

- Compute hydrostatic force against a rectangle, triangle, trapezoid, or circle. (Section 8.3 Example 1–2)



# What Is It?

## Credit Only For Mastery

Will the student benefit from studying the objective again?

- **Not Mastered**: Computations all correct, but integrand suggests student has not understood the geometry.
- **Mastered**: Integral correctly specified, but there are some minor computational errors.



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# What Is It?

## Multiple Chances With Complete Forgiveness

- Test 1: Objectives 1 - 4
- Test 2: Objectives 1 - 8
- Test 3: Objectives 1 - 12
- Test 4: Objectives 1 - 16
- Final Exam: Objectives 1 - 16

Master an objective eventually. No penalty for failed attempts.



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- Depth of Knowledge
  - **Points**: Understand everything superficially.
  - **Mastery**: Understand some concepts in great detail.
  - “I only want a B, but you’re forcing me to get an A.” – T. F.



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- Meaningful Office Hours
  - **Points:** “How can I easily pick up some points?” – All your students
  - **Mastery:** “What should I study to better understand this concept?” – P. H.



# Armchair Pedagogy

- Depth of Knowledge
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- Meaningful Office Hours
  - **Points:** “How can I easily pick up some points?” – All your students
  - **Mastery:** “What should I study to better understand this concept?” – P. H.
- Perseverance
  - **Points:** Try a problem once (maybe twice) and hope for the best.
  - **Mastery:** Keep trying until you succeed (and I know you can).



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- Timely Review
  - **Points:** Review key concepts for the final (maybe).
  - **Mastery:** Review key concepts now.
  - “I didn’t understand vectors on Test 1, but I’m glad I got them on Test 2.” – L. D. in *Vector Calculus*



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- Growth-Mindedness
  - **Points:** Failure is undesirable and incurs penalties.
  - **Mastery:** Failure is an opportunity to improve understanding.
  - L. N.: 2/14 after midterm (and in tears), 12/14 after final (and celebrating)



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  - L. N.: 2/14 after midterm (and in tears), 12/14 after final (and celebrating)
- Reduced\* Test Anxiety
  - **Points:** Every test has the potential to “ruin” GPA.
  - **Mastery:** No one test can harm grade.
  - \*Midterm with nothing mastered is very stressful



- Formative Assessment
  - **Points**: How many points is this error worth? (punitive)
  - **Mastery**: Will the student benefit from studying the concept again? (formative)
  - **Mastery?**: Will *this* student benefit from studying the concept again? (differentiated)



- Formative Assessment
  - **Points**: How many points is this error worth? (punitive)
  - **Mastery**: Will the student benefit from studying the concept again? (formative)
  - **Mastery?**: Will *this* student benefit from studying the concept again? (differentiated)
- Faster Grading
  - **Points**: Good answers are carefully checked. Bullshit is incentivized.
  - **Mastery**: Mastery is spotted instantly. All attempts are genuine.



# The Plural of Anecdote

140 students across 6 institutions

- The exams deepened my understanding of the ideas in this course. (80% agreement)
- The results of my exams accurately reflect my knowledge. (77% agreement)
- I feel prepared to approach a wide range of problems in this course. (75% agreement)
- I was anxious before the exams in this course. (36% disagreement)



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# Thanks

## Contact Me

[amohr@nebrwesleyan.edu](mailto:amohr@nebrwesleyan.edu)

## Mastery-Based Testing Resources

[www.AustinMohr.com](http://www.AustinMohr.com)



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