

Appropriate Assessment in AP Calculus

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58th Annual Georgia Math Conference, October 20, 2017



Two tests from 2002-03: Tell me anything you notice, good or bad.



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The fundamental question: What do I want to assess, and how do I want to assess it?



Two tests from 2012-13: Tell me anything you notice, good or bad.



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Write Better Tests

- ▶ Every test is a chance to do AP Exam preparation
 - ▶ Use multiple-choice and free-response
 - ▶ Part with a calculator and part without
 - ▶ Use/adapt old AP free-response for every test

Goal: Get students used to the AP Exam format, style, and timing, so that the actual AP Exam is not a surprise.



Write Better Tests

- ▶ Do not use test banks — unless you change the questions for your needs!
- ▶ Try not to let anyone else write your calculus tests!
- ▶ Do not allow kids to use their crutches. . .



Write Better Tests

Write the equation of the line tangent to the graph of $y = x^2 - 5x + 7$ at the point where $x = 3$.

- A) $y = x + 2$
- B) $y = -x + 2$
- C) $y = 2x + 1$
- D) $y = x - 2$
- E) $y = -x - 2$



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This is a BAD multiple-choice question!



Write Better Tests

This is a BETTER multiple-choice question:



Write Better Tests

This is a BETTER multiple-choice question:

The equation of the line tangent to the graph of $y = x^2 - 5x + 7$ at the point where $x = 3$ can be written in the form $y = m(x + n) + p$. Compute $m + n + p$.

- A) -1
- B) 0
- C) 1
- D) 2
- E) 3



Write Better Tests

Which of the following integrals represents the area under $y = (9 - x^2)^2$ over the interval $[-3, 3]$?

A) $\int_{-3}^3 (9 - x^2) \, dx$

B) $2 \int_0^3 (9 - x^2)^2 \, dx$

C) $\int_{-3}^3 (x^2 - 9)^2 \, dx$

D) $\frac{1}{2} \int_{-3}^3 (9 - x^2)^2 \, dx$

E) $-2 \int_{-3}^0 (9 - x^2)^2 \, dx$



Write Better Tests

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E) $-2 \int_{-3}^0 (9 - x^2)^2 \, dx$

This is an okay multiple-choice question.



Write Better Tests

This is a BETTER multiple-choice question:



Write Better Tests

This is a BETTER multiple-choice question:

The integral $2 \int_0^3 (9 - x^2)^2 dx$ represents which of the following?

- A) The area under $y = (9 - x^2)^2$ over $[0, 3]$
- B) The volume of the solid formed by revolving $y = 9 - x^2$ over $[0, 3]$ about the x -axis
- C) The volume of the solid whose base is $y = 9 - x^2$ over $[0, 3]$ and whose cross sections are squares
- D) The area under $y = (9 - x^2)^2$ over $[-3, 3]$
- E) The area under $y = 9 - x^2$ over $[0, 3]$



Write Better Tests

- ▶ Write your own questions
- ▶ Be a thief!



Two tests for 2017-18: Tell me anything you notice, good or bad.



Two tests for 2017-18: Tell me anything you notice, good or bad.

The fundamental question: What do I want to assess, and how do I want to assess it?



Grading

My philosophy:

- ▶ Students should learn from their mistakes



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- ▶ Students should be able to show that they have in fact learned from their mistakes



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- ▶ Students should be able to show that they have in fact learned from their mistakes
- ▶ I expect students to do have their work done by the next class; it is reasonable for students to expect me to have things graded by the next class
- ▶ Tests should be written, grading policies enacted, and plans made in such a way so that the above three statements are realities



Grading

Use AP-style Scoring Guidelines for your FRQs!
Copy them, adapt them, but eventually write your own



Grading

To curve or not to curve. . .



Grading

To curve or not to curve. . .

- ▶ AP conversion charts
- ▶ Curve to the class average
- ▶ Square root curve
- ▶ Test corrections
- ▶ Quizzes as formative data
- ▶ Multiple versions
- ▶ Bonus questions



Thank you!

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