Quizzical Derivatives

Purpose. This activity is intended to improve students' abilities to compute derivatives, by asking them to evaluate common student misconceptions on this topic. It is intended to get students thinking about mistakes that may be made while computing derivatives, and to help them develop self-regulation so that they will be more likely to avoid making similar mistakes themselves.

Preparation (before class) and implementation (in class). Make a copy of the quiz for each student. You may add/delete items from the quiz depending on the derivative rules you would like to assess.

Suggested directions. If you wish to make this project as discovery-based as possible, you can distribute the activity, or have it waiting on students' tables as they come in, without instructions. Alternatively, you can introduce the project with directions like the following:

> "Help! I was grading quizzes and this student, Sam, needs some help in learning and applying derivative rules. I got a little frustrated, and could use your help providing feedback on this quiz, to help Sam learn these rules. Please put a positive remark if Sam's answer is correct, and shows the correct work. If Sam does not have the correct answer and work, please provide Sam with constructive feedback. Show Sam the correct steps and the correct answer, along with any comments that may help Sam understand the errors made and misconceptions involved. Note that using a colored pen will help Sam distinguish between your comments and the work already done on the quiz. Good luck, and thank you for your help!!!"

Leading questions and general ideas. We suggest the instructor listen carefully as students discuss the grading of the quiz. This will help in the conclusion of this activity by highlighting rich discussions on the mathematical thinking that occurred during this activity.

As the students explore this activity, certain questions, like the following, may arise—or you may wish to bring them up to guide the students in their learning.

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Debrief. If possible, leave some time after the activity is completed for questions, and for discussion of the facts, procedures, and ideas that the activity was meant to reinforce.

Here are some possible takeaways from this activity:

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Follow-up challenge.