

ZMATH 2014b.00946

McCulloch, Allison W.; Kenney, Rachael H.; Allen Keene, Karen

What to trust: reconciling mathematical work done by hand with conflicting graphing calculator solutions.

Sch. Sci. Math. 113, No. 4, 201-210 (2013).

Summary: This paper reports on a mixed-methods study of 111 advanced placement calculus students' self-reports of their graphing calculator use, comfort, and rationale for trusting a solution produced with or without a graphing calculator when checking written work. It was found that there was no association between gender, teacher-reported mathematical ability, or comfort with the graphing calculator and students' trust in either a graphing calculator-produced solution or a solution produced without a graphing calculator. Furthermore, regardless of solution choice, the same four categories were evident in students' rationale for their solution choice: (a) an awareness of the possibility of careless errors, (b) the importance of checking over work, (c) a recognition of the limitations or affordances of the graphing calculator, and (d) a confidence (or lack thereof) in their own mathematical abilities. These results have implications for mathematics teaching as graphing calculators are used extensively in middle and high school mathematics classrooms and standardized tests in the United States.

Classification: U73 U74 C23 C24

Keywords: graphing calculator; paper and pencil work; mathematical abilities; self-confidence; awareness of errors; trust in graphing calculator-produced solutions; limitations of the graphing calculator

doi:10.1111/ssm.12016