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**College physics students' mathematical difficulties and their implications for high school physics teachers<sup>1</sup>** DAVID E. MELTZER, DAKOTA H. KING, Arizona State University — Over the past two years, we have administered a diagnostic test of basic mathematical skills to over 2000 students enrolled in introductory physics courses at Arizona State University, including both the algebra-based and calculus-based courses. Consistent with previous research, we find a great deal of confusion regarding the meaning of vector direction and graphical addition of vectors. However, more unexpectedly, we also find widespread difficulties with basic trigonometric and algebraic operations, with evidence that symbolic operations pose particular problems for many students. Interviews show that a large proportion of errors are due to lack of fluency or simple carelessness. We speculate that putting additional focus on certain trigonometric facts, combined with stronger emphasis on careful execution and checking of algebraic work, may yield significant dividends in physics at both the high school and college level.

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Prefer Oral Session

Prefer Poster Session

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