

College Math - Are Students Ready?

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Slides and technical details posted on
www.fac.worcester.edu/math/rbisk

The Problem - Too many students graduate from high school and are not prepared to begin college level work.

- In Massachusetts, 35% of public high school graduates in the class of 2005 enrolled in MA public higher education took at least one remedial course in their first semester; 28% took a remedial mathematics in their first semester. (Actual need is greater.)
- Finishing a course beyond the level of Algebra 2 (such as trigonometry or pre-calculus) more than doubles the odds that a student will complete a bachelor's degree.
- Jobs in science, technology, engineering, and mathematics (STEM) are the backbone of the Massachusetts economy.
- 40% of entering WSC freshman (2003-2005) scored in the "Needs Improvement" category on the grade 10 Math MCAS Exam. Over half needed remedial work.
- Grade 10 Math MCAS Exam (2007) "Needs Improvement" scores ranged from 32% to 56% correct.

The Solution –

1. Use a placement test to identify the strengths and needs of each student.

- The Massachusetts Board of Higher Education mandates use of the Accuplacer Elementary Algebra Exam for placement into college level math. Policy recommended in 1998 by task force representing all segments of public higher education.
- Study shows the effectiveness of the Accuplacer exam in identifying a student's readiness for college level math.

2. Provide a remedial math program that is flexible enough to meet the needs of each student efficiently.

- Worcester State College uses a system where students are placed into one of eight levels to help students progress mathematically without doing unnecessary work. Eight codes are used: 0 – 7. Codes 0, 1 and 2 are given to students that need remedial work. See WSC Placement Guide for more details.

Code 0: Places a student into Math Lab I (arithmetic review)

Code 1: Places a student into Developmental Mathematics Class – MA099 (full algebra review – 3 hours per week institutional credits)

Code 2: Places a student into Math Lab II (on line algebra review with weekly meetings)

Statistical Conclusions –Preliminary WSC Study

- Passing MCAS does not imply readiness for college level math classes.
- Retention is dependent on math proficiency indicators including Accuplacer and MCAS.

National Math Panel (2008)

“A major goal for K–8 mathematics education should be proficiency with fractions (including decimals, percents, and negative fractions), for such proficiency is foundational for algebra and, at the present time, seems to be severely underdeveloped. Proficiency with whole numbers is a necessary precursor for the study of fractions, as are aspects of measurement and geometry. These three areas—whole numbers, fractions, and particular aspects of geometry and measurement—are the Critical Foundations of Algebra.”

Real Life Math Problems Using Arithmetic

Solutions on website

1. You own two cars and drive them each the same number of miles each week. One car gets 10 mpg and the other gets 25 mpg. A genie offers to double the gas mileage of either car. Which do you choose?
 - a. 10 mpg to 20 mpg
 - b. 25 mpg to 50 mpg

2. You decide to buy your dream house. Since you can only afford a mortgage payment of \$2000 a month, you get a mortgage that starts at 4% interest for the first two years where you pay interest only. After two years, it resets and the interest rate can increase by as much as 2%. At that time you start paying principal too. If it does go up this much, what will your new monthly payment be?
 - a. Between \$2000 and 2200
 - b. Between \$2201 and 2500
 - c. Between \$2501 and 3000
 - d. More than \$3000