

# The Case for a Diagnostic Test in Math 125

For 30 years or more, I have given every student in my courses two take-home diagnostics. One was on algebra given out at the first class and collected in the second class. The other was on logic or exponents, depending on the course.

In Math 125, we gave a diagnostic this past semester, Fall 2021, as a take-home exam during the first week of class.

In my experience, a take-home diagnostic is just as effective as an in-class exam.

I will share the results of my 3 sections: all 86 students took the test.

Here are the statistics for Fall 2021, which match up rather well with my 30-year cumulative results.

Very good diagnostic (80 or more). Got straight A in course: 78% of them.

Failed the course with D, F or W: 11% of them.

Poor diagnostic (59 or less). Got straight A in course: 8% of them.

Failed the course with D, F, or W: 80% of them.

Overall rates of all students for comparison. straight A: 22% of class.

Failed the course with D, F, or W: 27% of class.

## Analysis of Results:

A very good diagnostic gives almost 4 times as much chance of getting A and about  $\frac{1}{3}$  of the chance of failing, as compared with the class overall.

A poor diagnostic gives 3 times as much chance of failing and about  $\frac{1}{3}$  the chance of getting A.

Put another way, a very good diagnostic result suggests about 10 times as much chance of getting an A as a poor diagnostic, while a poor diagnostic result indicates about 8 times as much chance of failing.

My previous results for the past 31 years had the numbers:

Very good diagnostic: about 84% chance of getting straight A in the course.

Poor diagnostic: about 88% chance of failing the course.

Does the Department want to make this diagnostic official policy?

If yes, it might be a good idea to have a conference before the end of drop and add with each student who did poorly on the diagnostic. On average, about 6 to 8 students in each section will do poorly.

I also recommend that there be some help from the Department so that all tests can be graded and returned by the third class of the semester. Perhaps Gradescope could be used.

Sheldon