Neat Teaching Ideas

Sectional Project NExT Program
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Building Proof-writing Skills

Particular Class:

A single-summer-session graduate class in matrix algebra.

Students:

In-service teachers seeking their M.A.Ed. or M.A.T., with varying numbers of years since their last linear algebra class.

Problem:

Weak-proof writing skills causing problems and anxiety dealing with homework assignments and tests.

Activity to Address Proof-Writing Skills: Group Proof-Writing

The Goal:

To build student's experience, confidence, and skill in formal proof-writing.

Activity:

At the end of classes, 15 - 40 minutes would be set aside, students would form groups of 2 - 3 and each group would be assigned a proof from that night's homework assignment. Each group discussed the statement and tackled writing their proof. At the end of the period, each group turned in a copy their proof (complete or incomplete). Results were then typed up in LaTeX (by the instructor) and posted on the class web-site.

Reaction/Benefits:

Very positive: it cut down on time spent on proof-writing, allowed students to concentrate on one problem yet have access to other proofs, and exposed students to a variety of proof-writing styles and techniques.

Teaching Logistic Models

Particular Class:

A First Year Seminar on Mathematical Models of Population Growth

Students:

First year (freshman) students at Western Carolina University with a wide variety of mathematics skills. Highest mathematics course completed ranged from Algebra I or II (approximately 60% of the class) to having had AP Statistics and/or Calculus (approximately 15%).

Activity: Risky Business

(Blatantly taken from the article "Dice and Disease in the Classroom" by Marilyn Stor and William L. Briggs, *Mathematics Teacher*, September 1998, Issue 6, pp. 464 - 468.)

The Goal:

Modeling the spread of a communicable disease through a population over time, explaining observed behavior, and the determining the effect of the parameters.

How to Play:

This is a timed activity with multiple stages. To start, each student is given a die, a data sheet, and a unique 3-digit ID number. During each two-minute stage, students mingle pair-wise, shake hands, exchange ID numbers, roll their dice, and record the results. As many exchanges as possible are completed in the two-minute period. Repeat this process for five stages.

When this process is over, roll a pair of die to determine a cut-off number (the sum of the die). The students then circle any interactions with a recorded sum higher than the cut-off. One of the ID numbers is also selected at random, represented the initial infected individual. Students check their data sheet to identify if they had a "risky" interaction with the infected individual. All new infected ID numbers are identified, and any interactions with an infected individual in the second stage are noted. The tracking process continues.

Graph the results and interpret the behavior of the data, effects of parameters, etc.

MATH 190 - Mathematical Models of Population Growth
Communicable Disease Data

Your Three-Digit ID Number:_____

Stage 1	Stage 2	Stage 3	Stage 4	Stage 5

Stage Number	Number of Infected Individuals
1	
2	
3	
4	
5	