

ZMATH 2016f.01110

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On solving systems of equations by successive reduction using 2×2 matrices.

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Summary: Usually a student learns to solve a system of linear equations in two ways: “substitution” and “elimination.” While the two methods will of course lead to the same answer they are considered different because the thinking process is different. In this paper the author solves a system in these two ways to demonstrate the similarity in the computation. She then sees that changing the point of view leads to a “simpler” way to solve a system of equations. This leads naturally to two other consequences, viz., what is known as Chio’s pivotal condensation process for computing determinants and Cramer’s Rule. While the condensation process for computing determinants is known, it is not widely known, and the manner of solving equations developed here has not been seen elsewhere. This should be of interest to anyone teaching solving systems of linear equations (especially by hand) and can be the basis for teaching the basics of solving systems of equations, or for use as a guided project. This material is particularly relevant for the topic of matrices in unit 2 of the Specialist Mathematics, the topic of Algebra and matrices in unit 1 of the General Mathematics curriculum, as well as anywhere where multivariate applications appear such as finding regression lines in the data collection topic in unit 3 of essential mathematics (perhaps as a special project) and the bivariate data analysis topic of unit 3 of the general mathematics curriculum. (ERIC)

Classification: H60

Keywords: systems of equations; matrices; Cramer’s rule