This workshop will describe a general approach that students should consider when taking math based problem-solving courses such as Calculus, Chemistry, Statistics, Physics, or Engineering. Before we begin, I would like to acknowledge that the University of Manitoba campuses are located on original lands of Anishinaabeg, Cree, Oji-Cree, Dakota, and Dene peoples, and on the homeland of the Metis nation. We respect the treaties that were made on these territories, we acknowledge the harms and mistakes of the past, and we dedicate ourselves to move forward in partnership with Indigenous communities in a spirit of reconciliation and collaboration. In order to explain how the GUESS method works, let's imagine that you've been given the following sample question from a Statistics course. The correlation between student midterm scores and final exam scores is 0.55. The midterm scores for all students has a mean of 85 and a standard deviation of six. The final exam has a mean of 70 and a standard deviation of nine. Gloria scored 93 on the midterm. What mark can we predict for her final exam score? This question involves calculating the line of least squares regression in order to find out if there is in fact a correlation between midterm and final exam marks. GUESS is an acronym that stands for Given, Unknown, Equations, Set-up, and Solve. Let's use the GUESS method to analyze this question and determine our next steps. In this particular example, you have been given a lot of information. Take a moment to organize your thoughts by listing all of the values that you've actually been given. Gloria's midterm score is 93. The mean grade for all of the midterms is 85 with a standard deviation of six. The mean grade for the final exams is 70 with a standard deviation of nine. You've also been given the correlation coefficient, which is R=0.55. This tells you that there is a slight correlation between midterm scores and final exam scores. Listing the unknowns will allow you to determine the next steps and start thinking about how you might acquire this information. The question is asking for Gloria's final exam score, so obviously this is unknown. You can predict her final exam score, but you will need to calculate the least-squares regression line in order to do so. After consulting the list of equations in step three, you will hopefully also notice that other unknowns include the intercept, which is represented here by the symbols b subscript 0, and the slope, which is represented by the symbols b subscript one. If you want to use the least squares regression formula, you will need both of these. Usually there is a formula or a method that can be followed which might involve invoking a known principle or some of the information that you already have listed as a given. Course instructors often provide a formula sheet at the outset of a course. By consulting the sheet, you will hopefully find a formula that can be of value when it comes to finding any unknown information. In this case, the equations to calculate both slope and intercept are available. You will need to figure out both of these unknowns in order to use the line of least squares regression equation, which we have been able to acquire from the course formula sheet. Fortunately, you have been given y-bar, x-bar, standard deviation of y, and standard deviation of x, which are required for these two formulas. With the help of the notes, you can use the least squares regression formula, y hat equals intercept plus slope times x to predict Gloria's final exam score, but only once you have first calculated both the slope and the intercept. It is important to use the formulas in proper sequence because the unknown slope is needed to calculate the unknown intercept. Once you've calculated the slope, you can calculate the intercept, which will provide all of the required information to calculate the line of least squares regression. As part of the last step, organizing all of your information using the GUESS table chart will hopefully give you a better sense of how to proceed when you first read the question. After you have determined the steps required, and set-up a procedure for arriving at a solution, it is time to substitute in the actual numerical values and solve the equation. After calculating both the slope 0.825 and the intercept -0.125, you can take Gloria's midterm score (x=93) and use these numbers to predict her final exam score, Remember, you are not alone and help is available. The Academic Learning Center's mission is to provide support to U of M students in the development of their skills in learning, writing, studying, and researching. Academic Learning Center services are free and they include workshops, one-to-one tutoring in

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