This Project is due Friday, April 27th. Neatness, Completeness and Margins count. Show all work.

Face-to-Face Students: This Writing Project is due by the end of class, Friday, April 27th.

Online Students: If you can do a quality scan to a single, multi-page PDF, you may submit your work by e-mail *in the Course Shell*. Use the E-Mail link in the Main Navbar, and attach it to a message to Harry Mills. I'm not accepting submissions to my steve.mills@aims.edu account.

Online Students may also drop their work by my office EDBH 134K. I'd be pleased to meet you, or just slide it under my door. If you *can't* scan to PDF or deliver in-person, then you may send it by regular U.S. Mail, to the following address:

Harry Mills
EDBH 134K
Aims Community College
5401 West 20th Street
Greeley, CO   80634

As long as it's postmarked by April 27th, I will accept it, even though I probably won't get it until the following week.

1. Solve the system of linear equations $\begin{array}{l} 3x - y = 6 \\ 2x + y = 8 \end{array}$ in 3 ways:

   a. (10 pts) Find the general vicinity of the solution by graphing the system. This should at least give you a general idea. Don't worry about it being super-accurate. Just graph the two lines by the intercept method. Supply the exact answer after you work parts b and c, below. Resist the temptation to use tickmarks on the horizontal and vertical axes.

   b. (10 pts) Use the Substitution Method

   c. (10 pts) Use the Elimination Method.

2. (10 pts) Use Elimination to solve the independent system of linear equations: $\begin{array}{l} 3x + 7y\ \ -z = -6 \\ x + 2y\quad\ \ = -1 \\ 4x + 10y - 3z = -11 \end{array}$.

3. Solve the dependent system of linear equations: $\begin{array}{l} x + 3y - 2z = 12 \\ 3x + 11y - 5z = 34 \\ 2x + 8y\ - 3z = 22 \end{array}$.

   a. (10 pts) Give the general solution. Be kind to your teacher and let z be free! That means, find an expression for x and y in terms of the variable z.

   b. (10 pts) Give the particular solutions corresponding to $z = 0$, $z = 1$ and $z = -1$.

4. **The Underlying Assumption:** *All* of the techniques we learn for solving systems of linear equations are based on the *assumption* that the systems *have* solutions. So when we arrive at a false (*absurd!*) statement after a few elimination steps, the only explanation is that there was no solution in the first place*. Our incorrect assumption* led to something absurd, like $0 = 10$ or $0 = -5$.

*... or you made a mechanical error and should check your work, just to make sure. Stay organized and always check your work.

Higher Learning: In higher mathematics, this is the most basic method of proving something is false: "Assume it's true and conclude something absurd (like '0 = 1')." It's important that you realize what's happening when you arrive at those absurdities at the end of a perfectly logical and legal sequence of moves. That said, let me *finally* get to the question:

$$x + 3y - 2z = 12$$

(10 pts) **Your Task:** Show that the dependent system of linear equations $3x + 11y - 5z = 34$

$$2x + 8y - 3z = 23$$

has no solution. I expect to see the word "absurd" in your discussion.