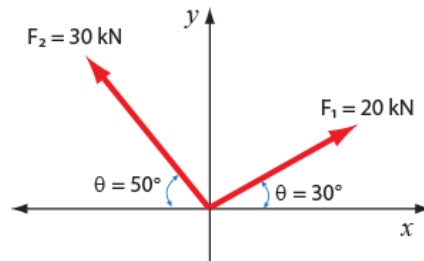
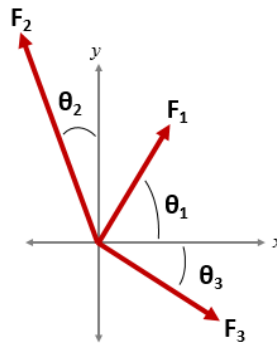


NOTE: Use engineering format for problems 1, 2 and 3. Use non-engineering format for problems 4 through 9. This is an individual assignment.

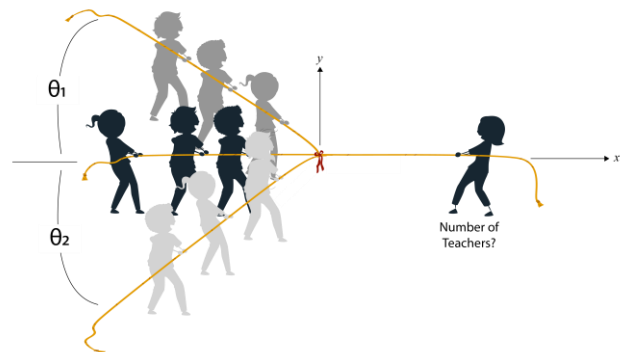
- Determine the magnitude and direction of the resultant force for the force system shown below. The direction of the resultant should be measured counterclockwise starting at the x-axis. Draw the resultant force and label the computed angle on an x-y coordinate system. **33.0 kN and 93.4°**



- Given that $F_1 = 70\text{lb}$, $F_2 = 150\text{lb}$, $F_3 = 90\text{lb}$, $\theta_1 = 55^\circ$, $\theta_2 = 22^\circ$, and $\theta_3 = 38^\circ$, determine the magnitude and direction of the resultant force for the force system shown below. The direction of the resultant should be measured counterclockwise starting at the x-axis. Draw the resultant force and label the computed angle on an x-y coordinate system. **151.31lb and 68.73°**



- A tug-of-war match between engineering students and professors is underway. The student team pulls on three separate ropes which are connected to a single rope that the professors pull. Each of the three student ropes is pulled by three students (nine students participate), and each student pulls with a force of 60 lbs. The angles $\theta_1 = 55^\circ$ and $\theta_2 = 60^\circ$.



The professors pull one rope in a straight line with each professor pulling with a force of 50 lbs. If the total force exerted by the professors must be greater than or equal to the x-component of the student resultant force, then how many professors are needed to win or at least tie the student team? **8 teachers**

4. Write a sketch to make your RGB LED change colors in any way that you choose; please do not use the same color combinations as the sample sketches in the presentation. Include your sketch in your homework and bring your RGB LED assembled on your Arduino to class next time. Have your Arduino/LED circuit out on your table with the program running so that your instructor can quickly check your work. **Do not turn your homework in at the front; have it ready so that the instructor can grade your activity.**
5. Come up with one idea for your “Idea Wallet” by thinking about something that bugs you. Your bug can be something that doesn’t work quite right or that could be improved, something that bothers you, or things that cause problems for others. For your homework, please name the project idea, write up at least a two-sentence description of the idea, and provide pictures/sketches of the idea (when it makes sense to do so).

NOTE: You don’t need to try to find a solution to the problem at this point!

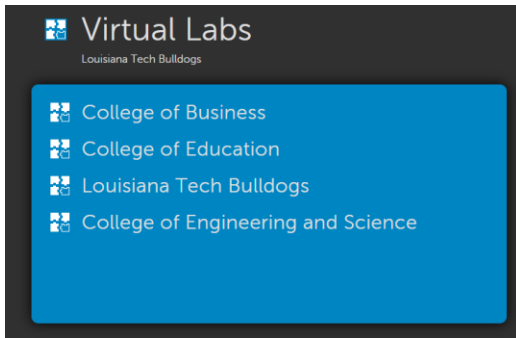
6. Find the ENGR 122 syllabus online. Provide the following information:
 - a. Date, time, and location of exam 1
 - b. Due date for prototype 1
 - c. Due date for prototype 2
 - d. Due date for prototype 3
 - e. Date of Freshman Design Expo
 - f. Due date for parts return
 - g. Date, time, and location of exam 2
 - h. Date of quiz 1
 - i. Number of service hours you need to log this quarter?
 - j. Number of COES meetings you need to attend this quarter?
 - k. Your professor’s office location, office phone number, and email address
7. Using the Internet and other sources, learn about ethical dilemmas surrounding biotechnology. Focusing on one or two dilemmas, write up two or three paragraphs describing what you have learned (from ½ to 1 page single spaced); be thinking about the impact that the biotechnology might have on your career. **We expect you to spend about a half hour completing this problem; this is not meant to be an exhaustive study of the topic.**
8. All students must install Mathcad to participate in ENGR 122. You will begin working with Mathcad in Class 2. Your instructor will email you a link with instructions on how to install the software.

If you are unable to install Mathcad, you can use the virtual workspace at anywhere.latech.edu. This is a temporary fix. The number of seats is limited, and you will not always be guaranteed access in class time depending on the amount of traffic to the site. You should download Mathcad as soon as possible.

Instructions for anywhere.latech.edu

Step 1: Navigate to anywhere.latech.edu on a browser

Step 2: Choose College of Engineering and Science



Step 3: If the vWorkspace connector is not installed, you must install it. Click Install.

Step 4: Run through the steps of .exe file. You may also need to install Adobe Flash Player for the virtual workspace to work.

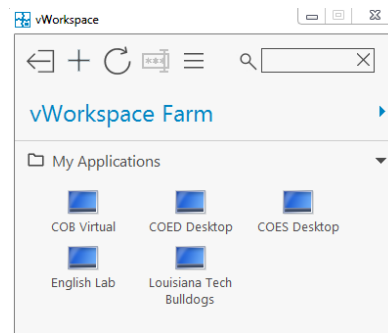
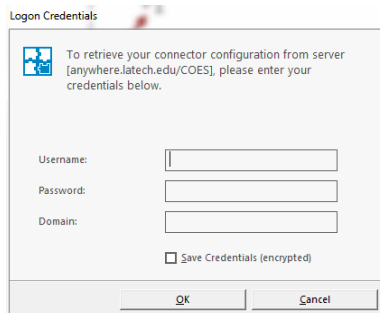
Step 5: Press retry, and you will likely be told the installation worked and to close the window.



Step 6: An icon will be placed on your desktop called vWorkspace. Click this icon and you will be asked for login credentials.

Step 7: Enter your credentials.

- Username: same as your Tech email username
- Password: same as your Tech email password
- Domain: AD3



Step 8: vWorkspace Farm window will open. Choose COES Desktop.

Note: You should be able to access the vWorkspace. You can use SolidWorks, Mathcad and any other COES program found on the workspace. Do not save anything to the workspace. It will be accessible to all that use the workspace. Instead, be sure to save files to the cloud (e.g.; Google Drive or Dropbox).

