

Name: _____.

CIE 272
Exam 1
15 October 2002

Directions. This is a 2-hour, open-book examination. There are **ten pages**. You are expected to do your own work. Answer the questions on the exam sheets. Partial credit will be only if I can understand how you arrived at your answers, so please *show your work*.

DON'T PANIC!

If you can't solve a problem, chances are good that many other students are in the same predicament. Also, if a question is unclear, don't hesitate to ask for clarification.

0. Write your name on the exam **NOW!**

1. (20 Points)

a. (10) Convert the following azimuths to bearings:

AB: Azimuth = $137^{\circ} 41'$

BC: Azimuth = $11^{\circ} 09'$

CD: Azimuth = $291^{\circ} 18'$

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- b. (10) Compute the magnetic bearings of **AB**, **BC**, and **CD** if the magnetic declination is $18^{\circ} 11' E$

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2. (30 Points) The bearings and lengths of a four-sided polygon are given in the table below. Compute the linear misclosure, make appropriate adjustments, and compute the coordinates of points **A**, **C**, and **D** if the coordinates of point **B** are (100.00, 1100.00).

Leg	AB	BC	CD	DA
Bearing	N 31° 50' E	N 58° 12' W	S 13° 11' E	S 58° 10' E
Length (ft)	292.70	878.10	413.33	585.78

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3. (10 Points) In Lab #1 you used a 100-ft steel tape to measure horizontal distances on the quad. However, every group allowed the tape to rest on the ground, so if the quad is not level, the measurements are not true *horizontal* distances.

The smallest division on the tapes is 0.01 ft. What is the smallest ground slope, in degrees and minutes, that would produce a noticeable error in the measurement? Based on your answer, do you think your taping measurements in Lab #1 were acceptable?

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4. (30 Points) A route survey is to be performed to place stakes at the following points:

Station	X-coordinate (ft)	Y-coordinate (ft)
A (BM)	150.00	650.00
B	700.00	350.00
C	1000.00	400.00
D	1300.00	550.00
E	1850.00	300.00

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- a. (10) Point **A** is a benchmark and is easily located. The surveyor sets up over **A**. What bearing and distance must he use to locate **B**?
- b. (10) The surveyor proceeds to stake out points **B**, **C**, and **D**. He sets up over **D** and is sighting back to a rod held at **C**. What angle to the right must he sweep to line up point **E**?

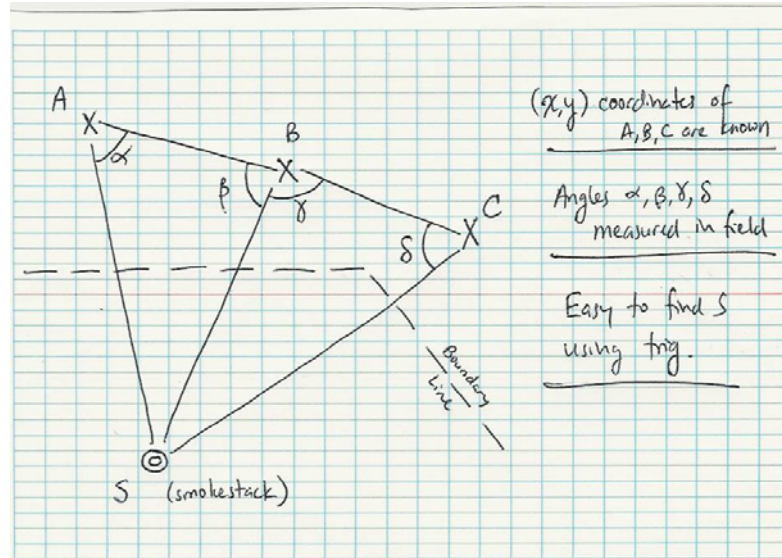
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- c. (10) The route **ABCDE** crosses a county boundary, which is defined by points **M** (1500.00, 0.00) and **N** (1500.00, 1000.00). Find the coordinates of the intersection of the county line and route **ABCDE**.

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5. (10 Points) Your boss has sent you out on a Friday afternoon to determine the coordinates of a smokestack that is a source of pollution. The owner of the land is hostile, and will not allow you on the property to make the measurements. Being a Syracuse University student, you devise a way to find the coordinates without going on the property.

Unfortunately, when you get back to the office on Monday morning you can't remember how you were going to compute the coordinates. You look at your field notes:



Show how the (x,y) coordinates of the smokestack, S , can be computed.