

**Faculty Of Engineering
Prince of Songkla University**

Mid-Term Examination
August 5th, 2007
221 – 361 Surveying II

1st Semester 2007
Room A203, A205
Time: 9:00 - 12:00 (3 hours)

Instructions

1. There are 5 problems in this exam. (100 points)
2. Attempt all problems.
3. Books and lecture notes are not allowed.
4. Students can bring in calculators and dictionaries.
5. Students can use pencils in the answer books.

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นาย รจ ศุภวิไล ผู้ออกข้อสอบ

- 1) From the control stations A B and the unknown point P, the angle \hat{PAB} and \hat{PBA} were measured by a Wild T2 Theodolite respectively. Please calculate the coordinates of the unknown station P (X_p and Y_p) by using the given field data.

A	P	L	283° 15' 21"		Angle $\hat{\alpha}$
	B	L	320° 54' 51"		
	B	R	140° 54' 47"		
	P	R	103° 15' 21"		
B	A	L	300° 07' 15"		Angle $\hat{\beta}$
	P	L	37° 38' 43"		
	P	R	217° 38' 47"		
	A	R	120° 07' 13"		

Given $X_A = 3,300.259$ m. $X_B = 3,047.954$ m.
 $Y_A = 3,082.183$ m. $Y_B = 3,048.344$ m. (20 points)

- 2) Given the following data from a three-point problem as

Points	X(m.)	Y(m.)
L	10,000.000	20,000.000
M	16,672.500	20,000.000
R	27,732.760	14,215.240

Point G is an unknown station. The measured resection angles $\hat{\alpha} = \hat{LGM} = 20^\circ 05' 53''$ and $\hat{\beta} = \hat{MGR} = 35^\circ 06' 08''$ respectively. Please calculate the coordinates of the unknown station G (X_G and Y_G) by using the Italian's method. (25 points)

- 3) How many types of network are there in triangulation? Please name the types of the network and sketch their configuration. Also discuss the advantages and disadvantages for each particular configuration. (15 points)

- 4) Adjust the quadrilateral ABCD of a given triangulation network until it satisfies the geometric conditions as well as the trigonometric condition. (30 points)

$$\hat{1} = 23^\circ 44' 38''$$

$$\hat{2} = 38^\circ 44' 05''$$

$$\hat{3} = 75^\circ 12' 14''$$

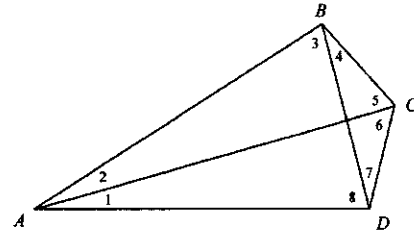
$$\hat{4} = 26^\circ 25' 51''$$

$$\hat{5} = 39^\circ 37' 48''$$

$$\hat{6} = 69^\circ 04' 21''$$

$$\hat{7} = 44^\circ 52' 02''$$

$$\hat{8} = 48^\circ 19' 09''$$



- 5) Describe the first scientific measurement of the earth circumference. Name the person who performed the expedition. Also explain his methodology as well as the result of his measurement. (10 points)
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