



Dear students,

Below are the solutions to assignment #5.

1- 10"

2- 2nd order, class II; $C = 10''/\sqrt{6} = 4.1''$;

Allowable by 2nd order, class II is 4.5"

3- Misclosure = -10"; Correction = +2" per angle

Balanced angles: A=105°13'16"; B= 92°36'08"; C= 67°15'24"; D= 217°24'32";

E = 57°30'40".

Azimuths: AB = 122°32'16"; BC = 35°08'24"; CD = 282°23'48"; DE = 319°48'20"; EA=197°19'00"

4-

Course	Length	Dep	Lat
AB	2,157.34	1818.717	-1160.337
BC	1,722.58	991.476	1408.637
CD	1,318.15	-1287.417	282.978
DE	1,536.06	-991.348	1173.333
EA	1,785.58	-531.483	-1704.647
$\Sigma =$	8,519.71	-0.054	-0.037

LEC = 0.065 ft; Relative precision = 1:130,000



5-

(a) Balanced departures and latitudes and coordinates.

Course	Dep	Lat	Point	X	Y
<i>AB</i>	1818.731	-1160.328	<i>A</i>	20,000.00	15,000.00
<i>BC</i>	991.487	1408.644	<i>B</i>	21,818.73	13,839.67
<i>CD</i>	-1287.409	282.984	<i>C</i>	22,810.22	15,248.32
<i>DE</i>	-991.338	1173.339	<i>D</i>	21,522.81	15,531.30
<i>EA</i>	-531.471	-1704.640	<i>E</i>	20,531.47	16,704.64

(b) $AB = 2157.35$ ft, $Az_{AB} = 122^{\circ}32'15''$; $DE = 1536.06$ ft, $Az_{DE} = 319^{\circ}48'22''$ (c) Adjusted angles at *A* and *C*.

Point	Angle
<i>A</i>	105°13'16"
<i>C</i>	67°15'25"



6-

- (a) Preliminary azimuths are listed below.
 (b) Unadjusted latitudes and departures are listed below.
 (c) **0.0235 m**
 (d) **1:78,000**

From WolfPack:

Station	Obs. Angle	Adj. Angle
A	120°07'50"	120°05'49"
B	91°57'50"	91°57'49"
C	121°44'06"	121°44'05"
D	82°02'08"	82°02'07"
E	124°10'11"	124°10'10"
Misclosure	5"	

Course	Length	Azimuth	Dep (m)	Lat (m)
AB	2862.392	179°50'39"	7.7851	-2862.3814
BC	4189.033	91°48'28"	4186.9481	-132.1491
CD	3815.353	33°32'33"	2108.1938	3180.0059
DE	3545.450	295°34'40"	-3288.1961	1573.8718
EF	3490.014	239°44'50"	-3014.7128	-1758.3244
Sum	1843.455		0.0182	1.0228

Linear misclosure **1.0229**
 Relative Precision **1:17,600**



7-

Solution from WolfPack

Course	Length	Bearing	Unbalanced	
			Dep	Lat
1-2	403.73	N8°17'02.0"E	58.169	399.518
2-3	622.63	N87°02'05.0"E	621.796	32.209
3-4	653.16	S14°47'06.0"W	-166.682	-631.534
4-1	550.84	N68°43'20.0"W	-513.290	199.894
Sum =	2,230.36		-0.007	0.087

Balanced			Coordinates	
Dep	Lat	Point	X	Y
58.170	399.502	1	10,000.00	5,000.00
621.798	32.185	2	10,058.17	5,399.50
-166.680	-631.559	3	10,679.97	5,431.69
-513.289	199.873	4	10,513.29	4,800.13

Linear misclosure = 0.087
 Relative Precision = 1 in 25,600

Area: 302,000 sq. ft.
 6.933 acres {if distance units are feet}

Adjusted Observations

Course	Distance	Bearing
1-2	403.71	N8°17'04"E
2-3	622.63	N87°02'13"E
3-4	653.18	S14°47'03"W
4-5	550.83	N68°43'27"W

GOOD LUCK,