PRIMER EXAMEN PARCIAL DEPARTAMENTAL DE TOPOGRAFIA.

NOMBRE DEL ALUMNO_____ GRUPO 2301

CALIF. 8

EXAMEN TIPO A

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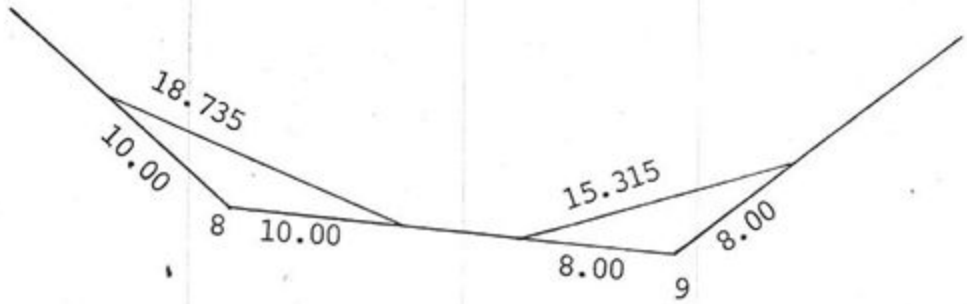
UNIVERSIDAD NACIONAL AUTÓNOMA DE MEXICO

1.- DE ACUERDO CON LOS DATOS DEL SIGUIENTE REGISTRO DE CAMPO, CALCULAR LOS ANGULOS INTERNOS, LA COMPROBACION ANGULAR Y LA SUPERFICIE.

EST	P.V.	D1	D2	NOTAS
1	2	34.610	34.623	L.C. = 30.000 m
2	3	43.575	43.593	terreno plano.
3	1	58.712	58.736	

2.- LA SIGUIENTE FIGURA REPRESENTA LA APLICACION DEL METODO DE LADOS DE LIGA EN UN LEVANTAMIENTO CON CINTA. CALCULAR LOS ANGULOS INTERIORES DE LOS VERTICES 8 Y 9.



3.- EL SIGUIENTE REGISTRO DE CAMPO PERTENECE A UN LEVANTAMIENTO CON BRUJULA Y CINTA. CALCULAR: 1] RUMBOS PROMEDIOS. 2] ANGULOS INTERNOS COMPENSADOS. 3] COMPROBACION ANGULAR.

EST	P.V.	RBO. DTO.	RBO. INV.	D1	D2	NOTAS
1	2	S 07°00' E	N 08°00' W	33.050	33.066	L.C. = 30.00 m
2	3	S 82°00' E	N 82°00' W	29.043	29.028	TERRENO PLANO
3	4	N 13°00' E	S 14°00' W	34.622	34.648	
4	5	N 49°00' W	S 48°00' E	26.709	26.726	
5	1	S 55°00' W	N 55°00' E	25.814	25.803	

4.- CALCULAR LA DISTANCIA SOBRE LA CIRCUNFERENCIA TERRESTRE QUE EXISTE ENTRE LOS PUNTOS A Y B DE ACUERDO A LAS SIGUIENTES COORDENADAS.

A: LATITUD = 19°30'10" N B : LATITUD = 24°04'30" N
LONGITUD = 99°48'38" W LONGITUD = 106°12'04" W

N O T A : CONSIDERAR UN RADIO MEDIO DE LA TIERRA DE 6378.00 KILOMETROS.

5.- CALCULAR LOS RUMBOS DIRECTOS QUE CORRESPONDEN A LOS SIGUIENTES AZIMUTES DIRECTOS

LADO	AZIMUT DIRECTO
1-2	234°34'
2-3	356°49'
3-4	158°28'
4-5	189°05'
5-6	89°50'

ACATLAN, EDO. DE MEX., ABRIL 18 DE 1994.

(1-)

1-2 $TL = 2(0.02\,m)\sqrt{\frac{34.6165}{30}} = 0.05\,m$

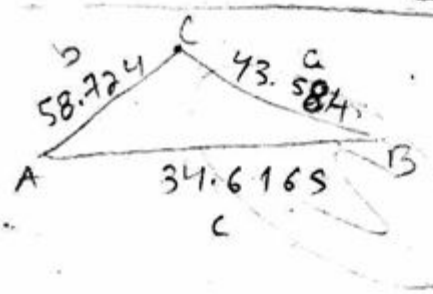
Error = 0.013 Error < TL

2-3 $TL = 2(0.02\,m)\sqrt{\frac{43.584}{30}} = 0.05\,m$

Error = 0.02 Error < TL

3-1 $TL = 2(0.02\,m)\sqrt{\frac{58.724}{30}} = 0.06\,m$

Error = 0.024 Error < TL



$S = \frac{a+b+c}{2} = 68.46225$

$S-a = 24.87825$
$S-b = 9.73825$
$S-c = 33.84575$
$ab = 2559.426816$
$bc = 2032.819346$
$ac = 1508.725536$

$\operatorname{Sen}\frac{1}{2}A = \sqrt{\frac{(S-b)(S-c)}{bc}} = \sqrt{\frac{(9.73825)(33.84575)}{2032.819346}}$

$A = 47^\circ\ 29'\ 23''$

$\operatorname{Sen}\frac{1}{2}B = \sqrt{\frac{(S-a)(S-c)}{ac}} = \sqrt{\frac{(24.87825)(33.84575)}{1508.6736.1}}$

$B = 96^\circ\ 40'\ 31''$

$\operatorname{Sen}\frac{1}{2}C = \sqrt{\frac{(S-a)(S-b)}{ab}} = \sqrt{\frac{(24.87825)(9.73825)}{2559.426816}}$

$C = 35^\circ\ 50'\ 14''$

Comprobacion $\Sigma \theta int = 180(n-2) = 180(3-2) = 180^\circ$

$\angle 1 = 47^\circ\ 29'\ 23'' - 8 = 47^\circ\ 29'\ 15'$
$\angle 2 = 96^\circ\ 40'\ 31''$ $Ea = +8''$
$\angle 3 = 35^\circ\ 50'\ 14''$

$180^\circ\ 00'\ 08''$
$180^\circ\ 00'\ 00''$

$Sup_1 = \frac{1}{2}\, ab\, sen C = \frac{1}{2}(43.5840)(58.724)\, sen\ 35°\ 50'\ 14''$

$= 749.252312\ 9\ m^2$

$Sup_2 = \frac{1}{2}\, bc\, sen A = \frac{1}{2}(58.724)(34.616 5)\, sen\ 47°\ 29'\ 15''$

$= 749.225\ 2844\ m^2$

$Sup\ prom = \frac{Sup_1 + Sup_2}{2} = \underline{749.239\ m^2}$

2

2.-

$sen\ \frac{1}{2}\Delta 8 = \frac{9.3675}{10} = 0.93675$

$\Delta 8 = \underline{139°\ 1°\ 32''}$

$sen\ \frac{1}{2}\Delta 9 = \frac{7.6575}{8} = 0.9571875$

$\Delta 9 = \underline{146°\ 20°\ 52''}$

3.-

Est	Pv	Rbo	Prom	Dprom
1	2	S 7° 30' E		33.058
2	3	S 82° 00' E		29.0355
3	4	N 13° 30' E		34.635
4	5	N 48° 30' W		26.7175
5	1	S 55° 00' W		25.8085

1-2 $TL = 2(0.02\ m)\sqrt{\frac{33.058}{30}} = 0.042\ m$ Error = 0.02 m E ∠ TL

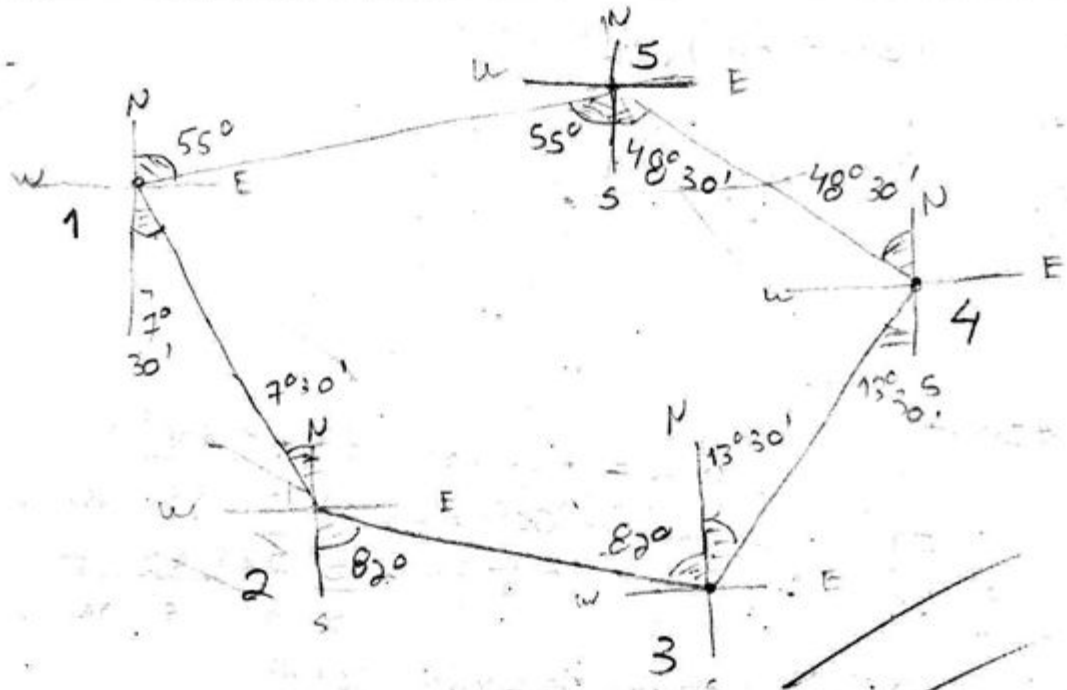
2-3 $TL = 2(0.02\ m)\sqrt{\frac{29.0355}{30}} = 0.04\ m$ Error = 0.015 m E ∠ TL

3-4 $TL = 2(0.02\ m)\sqrt{\frac{34.635}{30}} = 0.04\ m$ Error = 0.026 m E ∠ TL

4-5 $TL = 2(0.02\ m)\sqrt{\frac{26.7175}{30}} = 0.04\ m$ Error = 0.017 m E ∠ TL

5 1 $TL = 2(0.02\ m)\sqrt{\frac{25.8085}{30}} = 0.04\ m$ Error = 0.011 m E ∠ TL

Tolerancia angular $= 1\sqrt{5} = \underline{\pm 2.24}$



$\Delta 1 = 180° - (55°00' + 7°30') =$ 117° 30'

$\Delta 2 = 180° - 82° + 7°30' =$ 105° 30'

$\Delta 3 = 82° + 13°30' = 95°30'$ 95° 30'

$\Delta 4 = 180° - (48°30' + 13°30') =$ 118° 00'

$\Delta 5 = 55°00' + 48°30' =$ 103° 30'

540° 00'

Error angular = 00° 00' 00"

4.- A $\begin{cases} \rho = 19° 30' 10'' \text{ N} \\ h = 99° 48' 38'' \text{ W} \end{cases}$ B $\begin{cases} \rho = 24° 04' 30'' \text{ N} \\ h = 106° 12' 04'' \text{ W} \end{cases}$

$a = 90 - \rho_B = 65° 55' 30''$

$b = 90 - \rho_A = 70° 29' 50''$

$C = h_B - h_A = 6° 23' 26''$

$\text{Sen } c = \cos a \cos b + \text{Sen } a \text{ sen } b \cos C$

$= (\cos 65° 55' 30'')(\cos 70° 29' 50'')$

$+ (\text{Sen } 65° 55' 30'')(\text{Sen } 70° 29' 50'')(\cos 6° 23' 26'')$

$\text{Sen } c = 0.136189183 + 0.855281$

$= 0.99147$

$c = 82° 30' 40''$

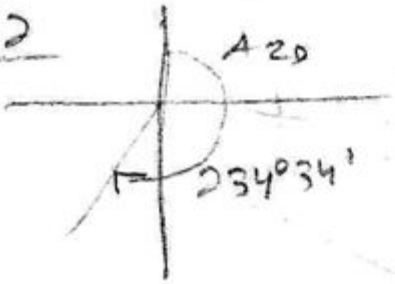
$$D = \frac{\pi R \theta}{180^\circ} = \frac{(\pi)(6378\ km)(82^\circ 30' 40'')}{180^\circ}$$

$$D = 9184.898\ km$$

5.-

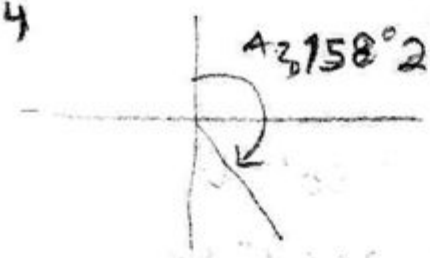
Lado	Azimut directo		
1-2	234° 34'	—	$Rbo_D = Az - 180° = S\ 54°\ 34'\ W$
2-3	356° 49'	—	$Rbo_D = 360° - Az = N\ 3°\ 11'\ W$
3-4	158° 28'	—	$Rbo_D = 180° - Az = S\ 21°\ 32'\ E$
4-5	189° 05'	—	$Rbo_D = Az - 180° = S\ 9°\ 05'\ W$
5-6	89° 50'	—	$Rbo = A_Z = N\ 89°\ 50'\ E$

1-2

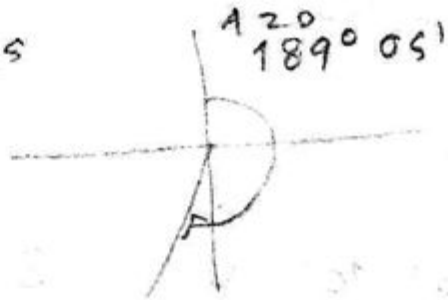


2-3

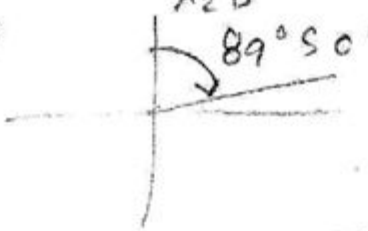
3-4



4-5



5-6



LADO	Rumbo directo		
1-2	S	54° 34'	W
2-3	N	3° 11'	W
3-4	S	21° 32'	E
4-5	S	9° 05'	W
5-6	N	89° 50'	E