



Theodolite

1-The initial angle is $50^{\circ} 10'$ and after the first repetition the reading is $160^{\circ} 25'$. After the ten repetition, the horizontal circle reading is $72^{\circ} 42'$. Compute the value of the angle?

2- A horizontal angle was measured by repetition method with a transit 12 times, if the initial reading is $70^{\circ} 10' 30''$, the first reading and the final reading are $170^{\circ} 30' 30''$ and $194^{\circ} 11' 30''$ respectively. Compute the mean value of the angle.

3-A horizontal angle was measured by repetition method with a transit 10 times as follows:

Initial Reading	First Reading	Final reading
$30^{\circ} 45'$	$100^{\circ} 15'$	$5^{\circ} 55'$

Compute the mean value of the angle?

4-The theodolite was set on station A to measure directions B, C, and D. The observed directions for one position were as follow. Compute the average angles for both horizontal and vertical directions.

Station	To	Face	H.C.R	V.C.R
A	B	L	$10^{\circ} 00' 05''$	$85^{\circ} 12' 34''$
		R	$190^{\circ} 00' 13''$	$274^{\circ} 47' 40''$
	C	L	$60^{\circ} 52' 06''$	$77^{\circ} 38' 43''$
		R	$240^{\circ} 52' 14''$	$282^{\circ} 21' 33''$
	D	L	$130^{\circ} 16' 50''$	$91^{\circ} 57' 33''$
		R	$310^{\circ} 16' 58''$	$268^{\circ} 02' 43''$
	B	L	$10^{\circ} 00' 11''$	$85^{\circ} 12' 30''$
		R	$190^{\circ} 00' 13''$	$274^{\circ} 47' 42''$

5-From the following observation, calculate the index error. Also compute the vertical angles.

Station	To	Face	V.C.R
D	A	L	87° 20' 49"
		R	272° 39' 33"
	B	L	71° 45' 15"
		R	288° 14' 57"
	C	L	91° 25' 39"
		R	268° 34' 31"

6- Complete the following table to determine the angle ABC, and if AB=700m, BC =850m, calculate the distance AC on a map drawn with scale of 1: 1000.

Station	Observed	H.C.R	
		F.L	F.R
B	A	00° 04'	180° 07'
	C	75° 28'	255° 32'

7- Determine of the distance between points d and c, which separated by waterway. The line ab of length 250m was chosen. The angles shown in figure were measured.

