

Assignment 1:

1. Why the grid sheet of scale 1:100000 measures 50km*50km on ground (i.e. why 1° latitude/longitude in a plane where Nepal lies measures 100km)?

Answer:

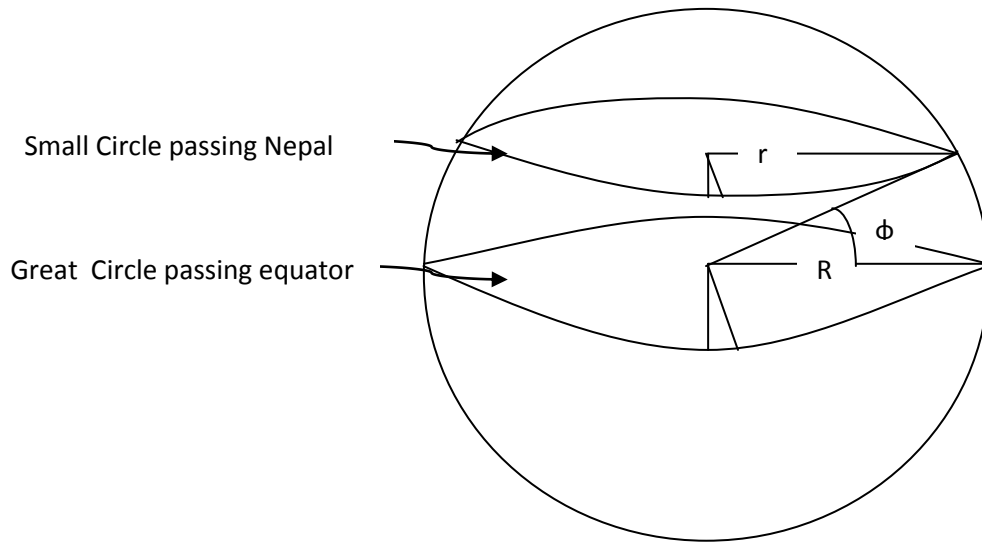


Figure: Relation between arc length and radius and radius of small and great circle

Here, radius of earth(R)=6377km

Radius of circle passing through great circle(r) = $R\cos\phi$, where ϕ is the latitude of Nepal where it lies

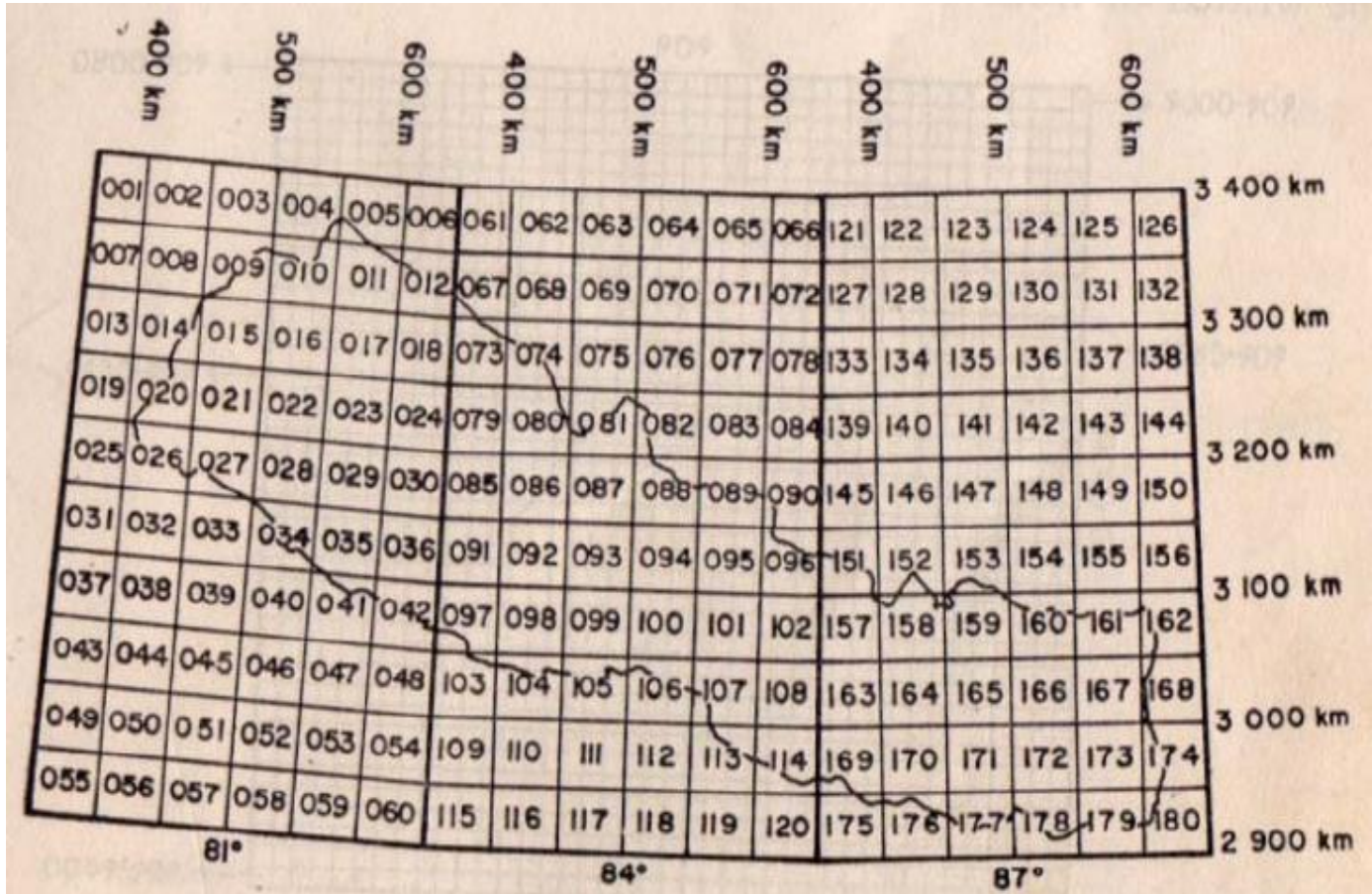
Thus, $\phi = 26^\circ$

Then, $r = 5731.609\text{km}$

Arc length subtended by 1° at surface at latitude of $26^\circ = 1 \times 5731.609 \times \pi / 180 = \mathbf{100.035\text{km}}$

2. Sheet Numbering System in Nepal(Model) for Cadastral Map

For large scale sheet numbering purpose, Nepal lies in three 3° zone numbered as 44.0, 44.5, 45.0 with central meridian 81°E, 84°E and 87°E. Each 3° zone is divided into grid squares of 50km*50km called grid sheet which are at a scale of 1:100000. Nepal is divided into 10 belts of latitude for numbering X-coordinate measuring from 2900 to 3400km from equator (0 km). Thus there are 60 grid sheets in each zone and 180 total grid sheets covering whole Nepal numbering from 001 to 180 as in the figure.

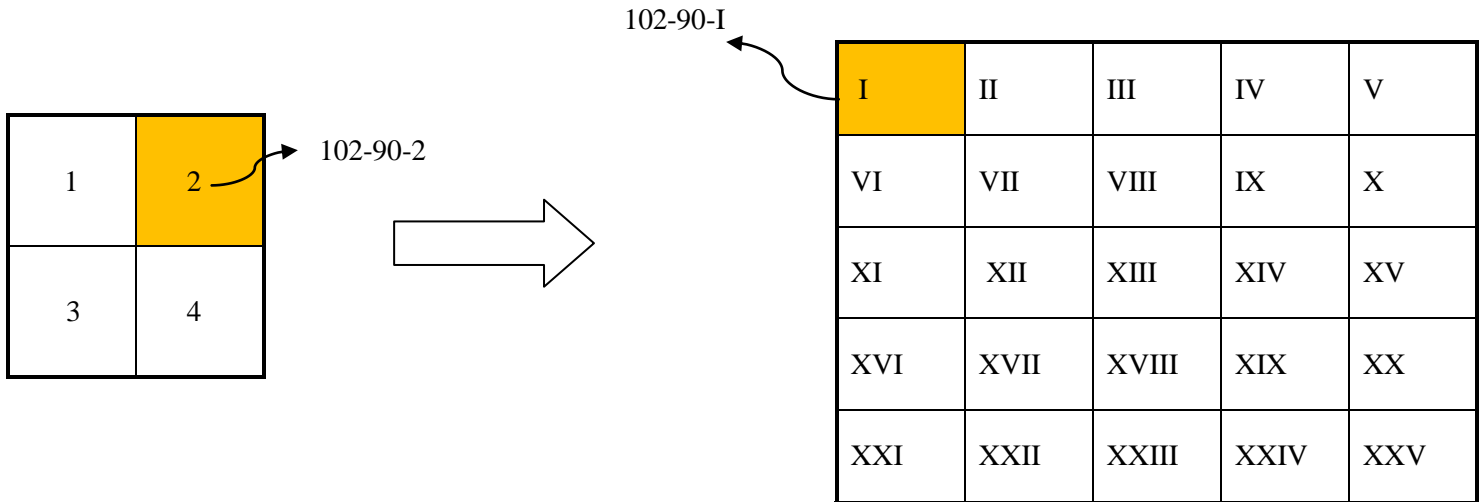


01	02	03	04	05	06	07	08	09	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	3	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

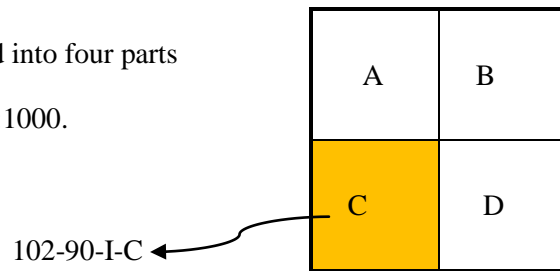
The scale of each grid sheet is 1:100000. Hence to obtain map of scale 1:10000, we need to cover 5km*5km by each map sheet, thus we need to make 10*10=100 parts of each grid sheet of scale 1:100000. This can be done as shown below. The numbering can be done as from 01 to 100. An example sheet of this scale is written as 120-9.

120-9

The 1:10000 map sheets can be further divided into four parts to get a map sheet of scale 1:5000 or also can be divided into $5*5=25$ parts to obtain map sheet of scale 1:2000. The numbering systems are shown in the figure below.



The map sheet of scale 1:2000 can be further divided into four parts thus resulting each map sheet at a desired scale of 1:1000.



Submitted By: Dipesh Suwal

Geomatics Engineering Batch 2010

Roll No: 29

Cadastre