

TABLE 13  
Geographic Range

Object Height		Height of eye of observer in feet and meters											Object Height	
Feet		7	10	13	16	20	23	26	30	33	36	Feet		
Meters		2	3	4	5	6	7	8	9	10	11	Meters		
		Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles			
0	0	3.1	3.7	4.2	4.7	5.2	5.6	6.0	6.4	6.7	7.0	0	0	
3	1	5.1	5.7	6.2	6.7	7.3	7.6	8.0	8.4	8.7	9.0	1	3	
7	2	6.2	6.8	7.3	7.8	8.3	8.7	9.1	9.5	9.8	10.1	2	7	
10	3	6.8	7.4	7.9	8.4	8.9	9.3	9.7	10.1	10.4	10.7	3	10	
13	4	7.3	7.9	8.4	8.9	9.5	9.8	10.2	10.6	10.9	11.2	4	13	
16	5	7.8	8.4	8.9	9.4	9.9	10.3	10.6	11.1	11.4	11.7	5	16	
20	6	8.3	8.9	9.5	9.9	10.5	10.8	11.2	11.6	12.0	12.3	6	20	
23	7	8.7	9.3	9.8	10.3	10.8	11.2	11.6	12.0	12.3	12.6	7	23	
26	8	9.1	9.7	10.2	10.6	11.2	11.6	11.9	12.4	12.7	13.0	8	26	
30	9	9.5	10.1	10.6	11.1	11.6	12.0	12.4	12.8	13.1	13.4	9	30	
33	10	9.8	10.4	10.9	11.4	12.0	12.3	12.7	13.1	13.4	13.7	10	33	
36	11	10.1	10.7	11.2	11.7	12.3	12.6	13.0	13.4	13.7	14.0	11	36	
39	12	10.4	11.0	11.5	12.0	12.5	12.9	13.3	13.7	14.0	14.3	12	39	
43	13	10.8	11.4	11.9	12.4	12.9	13.3	13.6	14.1	14.4	14.7	13	43	
46	14	11.0	11.6	12.2	12.6	13.2	13.5	13.9	14.3	14.7	15.0	14	46	
49	15	11.3	11.9	12.4	12.9	13.4	13.8	14.2	14.6	14.9	15.2	15	49	
52	16	11.5	12.1	12.7	13.1	13.7	14.0	14.4	14.8	15.2	15.5	16	52	
56	17	11.9	12.5	13.0	13.4	14.0	14.4	14.7	15.2	15.5	15.8	17	56	
59	18	12.1	12.7	13.2	13.7	14.2	14.6	15.0	15.4	15.7	16.0	18	59	
62	19	12.3	12.9	13.4	13.9	14.4	14.8	15.2	15.6	15.9	16.2	19	62	
66	20	12.6	13.2	13.7	14.2	14.7	15.1	15.5	15.9	16.2	16.5	20	66	
72	22	13.0	13.6	14.1	14.6	15.2	15.5	15.9	16.3	16.6	16.9	22	72	
79	24	13.5	14.1	14.6	15.1	15.6	16.0	16.4	16.8	17.1	17.4	24	79	
85	26	13.9	14.5	15.0	15.5	16.0	16.4	16.8	17.2	17.5	17.8	26	85	
92	28	14.3	14.9	15.4	15.9	16.5	16.8	17.2	17.6	17.9	18.2	28	92	
98	30	14.7	15.3	15.8	16.3	16.8	17.2	17.5	18.0	18.3	18.6	30	98	
115	35	15.6	16.2	16.8	17.2	17.8	18.2	18.5	19.0	19.3	19.6	35	115	
131	40	16.5	17.1	17.6	18.1	18.6	19.0	19.4	19.8	20.1	20.4	40	131	
148	45	17.3	17.9	18.5	18.9	19.5	19.8	20.2	20.6	21.0	21.3	45	148	
164	50	18.1	18.7	19.2	19.7	20.2	20.6	20.9	21.4	21.7	22.0	50	164	
180	55	18.8	19.4	19.9	20.4	20.9	21.3	21.7	22.1	22.4	22.7	55	180	
197	60	19.5	20.1	20.6	21.1	21.7	22.0	22.4	22.8	23.1	23.4	60	197	
213	65	20.2	20.8	21.3	21.8	22.3	22.7	23.0	23.5	23.8	24.1	65	213	
230	70	20.8	21.4	22.0	22.4	23.0	23.4	23.7	24.2	24.5	24.8	70	230	
246	75	21.4	22.1	22.6	23.0	23.6	24.0	24.3	24.8	25.1	25.4	75	246	
262	80	22.0	22.6	23.2	23.6	24.2	24.5	24.9	25.3	25.7	26.0	80	262	
279	85	22.6	23.2	23.8	24.2	24.8	25.2	25.5	26.0	26.3	26.6	85	279	
295	90	23.2	23.8	24.3	24.8	25.3	25.7	26.1	26.5	26.8	27.1	90	295	
312	95	23.8	24.4	24.9	25.3	25.9	26.3	26.6	27.1	27.4	27.7	95	312	
328	100	24.3	24.9	25.4	25.9	26.4	26.8	27.2	27.6	27.9	28.2	100	328	
361	110	25.3	25.9	26.4	26.9	27.5	27.8	28.2	28.6	29.0	29.3	110	361	
394	120	26.3	26.9	27.4	27.9	28.5	28.8	29.2	29.6	29.9	30.2	120	394	
427	130	27.3	27.9	28.4	28.9	29.4	29.8	30.1	30.6	30.9	31.2	130	427	
459	140	28.2	28.8	29.3	29.7	30.3	30.7	31.0	31.5	31.8	32.1	140	459	
492	150	29.0	29.7	30.2	30.6	31.2	31.6	31.9	32.4	32.7	33.0	150	492	
525	160	29.9	30.5	31.0	31.5	32.0	32.4	32.8	33.2	33.5	33.8	160	525	
558	170	30.7	31.3	31.9	32.3	32.9	33.2	33.6	34.0	34.4	34.7	170	558	
591	180	31.5	32.1	32.7	33.1	33.7	34.1	34.4	34.9	35.2	35.5	180	591	
623	190	32.3	32.9	33.4	33.9	34.4	34.8	35.2	35.6	35.9	36.2	190	623	
656	200	33.1	33.7	34.2	34.6	35.2	35.6	35.9	36.4	36.7	37.0	200	656	
722	220	34.5	35.1	35.7	36.1	36.7	37.0	37.4	37.8	38.2	38.5	220	722	
787	240	35.9	36.5	37.0	37.5	38.1	38.4	38.8	39.2	39.5	39.8	240	787	
853	260	37.3	37.9	38.4	38.9	39.4	39.8	40.1	40.6	40.9	41.2	260	853	
919	280	38.6	39.2	39.7	40.1	40.7	41.1	41.4	41.9	42.2	42.5	280	919	
984	300	39.8	40.4	40.9	41.4	41.9	42.3	42.7	43.1	43.4	43.7	300	984	

TABLE 13  
Geographic Range

Object Height		Height of eye of observer in feet and meters											Object Height	
Feet		39	43	46	49	52	56	59	62	66	69	Feet		
Meters		12	13	14	15	16	17	18	19	20	21	Meters		
		Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles			
0	0	7.3	7.7	7.9	8.2	8.4	8.8	9.0	9.2	9.5	9.7	0	0	
3	1	9.3	9.7	10.0	10.2	10.5	10.8	11.0	11.2	11.5	11.7	1	3	
7	2	10.4	10.8	11.0	11.3	11.5	11.9	12.1	12.3	12.6	12.8	2	7	
10	3	11.0	11.4	11.6	11.9	12.1	12.5	12.7	12.9	13.2	13.4	3	10	
13	4	11.5	11.9	12.2	12.4	12.7	13.0	13.2	13.4	13.7	13.9	4	13	
16	5	12.0	12.4	12.6	12.9	13.1	13.4	13.7	13.9	14.2	14.4	5	16	
20	6	12.5	12.9	13.2	13.4	13.7	14.0	14.2	14.4	14.7	15.0	6	20	
23	7	12.9	13.3	13.5	13.8	14.0	14.4	14.6	14.8	15.1	15.3	7	23	
26	8	13.3	13.6	13.9	14.2	14.4	14.7	15.0	15.2	15.5	15.7	8	26	
30	9	13.7	14.1	14.3	14.6	14.8	15.2	15.4	15.6	15.9	16.1	9	30	
33	10	14.0	14.4	14.7	14.9	15.2	15.5	15.7	15.9	16.2	16.4	10	33	
36	11	14.3	14.7	15.0	15.2	15.5	15.8	16.0	16.2	16.5	16.7	11	36	
39	12	14.6	15.0	15.2	15.5	15.7	16.1	16.3	16.5	16.8	17.0	12	39	
43	13	15.0	15.3	15.6	15.9	16.1	16.4	16.7	16.9	17.2	17.4	13	43	
46	14	15.2	15.6	15.9	16.1	16.4	16.7	16.9	17.1	17.4	17.7	14	46	
49	15	15.5	15.9	16.1	16.4	16.6	16.9	17.2	17.4	17.7	17.9	15	49	
52	16	15.7	16.1	16.4	16.6	16.9	17.2	17.4	17.6	17.9	18.2	16	52	
56	17	16.1	16.4	16.7	16.9	17.2	17.5	17.7	18.0	18.3	18.5	17	56	
59	18	16.3	16.7	16.9	17.2	17.4	17.7	18.0	18.2	18.5	18.7	18	59	
62	19	16.5	16.9	17.1	17.4	17.6	18.0	18.2	18.4	18.7	18.9	19	62	
66	20	16.8	17.2	17.4	17.7	17.9	18.3	18.5	18.7	19.0	19.2	20	66	
72	22	17.2	17.6	17.9	18.1	18.4	18.7	18.9	19.1	19.4	19.6	22	72	
79	24	17.7	18.1	18.3	18.6	18.8	19.2	19.4	19.6	19.9	20.1	24	79	
85	26	18.1	18.5	18.7	19.0	19.2	19.5	19.8	20.0	20.3	20.5	26	85	
92	28	18.5	18.9	19.2	19.4	19.7	20.0	20.2	20.4	20.7	20.9	28	92	
98	30	18.9	19.3	19.5	19.8	20.0	20.3	20.6	20.8	21.1	21.3	30	98	
115	35	19.9	20.2	20.5	20.7	21.0	21.3	21.5	21.8	22.1	22.3	35	115	
131	40	20.7	21.1	21.3	21.6	21.8	22.1	22.4	22.6	22.9	23.1	40	131	
148	45	21.5	21.9	22.2	22.4	22.7	23.0	23.2	23.4	23.7	24.0	45	148	
164	50	22.3	22.7	22.9	23.2	23.4	23.7	24.0	24.2	24.5	24.7	50	164	
180	55	23.0	23.4	23.6	23.9	24.1	24.5	24.7	24.9	25.2	25.4	55	180	
197	60	23.7	24.1	24.4	24.6	24.9	25.2	25.4	25.6	25.9	26.1	60	197	
213	65	24.4	24.7	25.0	25.3	25.5	25.8	26.1	26.3	26.6	26.8	65	213	
230	70	25.1	25.4	25.7	25.9	26.2	26.5	26.7	27.0	27.2	27.5	70	230	
246	75	25.7	26.0	26.3	26.5	26.8	27.1	27.3	27.6	27.9	28.1	75	246	
262	80	26.2	26.6	26.9	27.1	27.4	27.7	27.9	28.2	28.4	28.7	80	262	
279	85	26.8	27.2	27.5	27.7	28.0	28.3	28.5	28.8	29.0	29.3	85	279	
295	90	27.4	27.8	28.0	28.3	28.5	28.9	29.1	29.3	29.6	29.8	90	295	
312	95	28												

**TABLE 13**  
**Geographic Range**

Object Height	Height of eye of observer in feet and meters											Object Height	
Feet	72	75	79	82	85	89	92	95	98	115	Feet		
	Meters												
	Meters	22	23	24	25	26	27	28	29	30	35	Meters	
		Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles		
0	0	9.9	10.2	10.4	10.6	10.8	11.0	11.2	11.4	11.6	12.5	0	0
3	1	12.0	12.2	12.4	12.6	12.8	13.1	13.2	13.4	13.6	14.6	1	3
7	2	13.0	13.3	13.5	13.7	13.9	14.1	14.3	14.5	14.7	15.6	2	7
10	3	13.6	13.9	14.1	14.3	14.5	14.7	14.9	15.1	15.3	16.2	3	10
13	4	14.1	14.4	14.6	14.8	15.0	15.3	15.4	15.6	15.8	16.8	4	13
16	5	14.6	14.9	15.1	15.3	15.5	15.7	15.9	16.1	16.3	17.2	5	16
20	6	15.2	15.4	15.6	15.8	16.0	16.3	16.5	16.6	16.8	17.8	6	20
23	7	15.5	15.8	16.0	16.2	16.4	16.6	16.8	17.0	17.2	18.2	7	23
26	8	15.9	16.2	16.4	16.6	16.8	17.0	17.2	17.4	17.5	18.5	8	26
30	9	16.3	16.6	16.8	17.0	17.2	17.4	17.6	17.8	18.0	19.0	9	30
33	10	16.6	16.9	17.1	17.3	17.5	17.8	17.9	18.1	18.3	19.3	10	33
36	11	16.9	17.2	17.4	17.6	17.8	18.1	18.2	18.4	18.6	19.6	11	36
39	12	17.2	17.5	17.7	17.9	18.1	18.3	18.5	18.7	18.9	19.8	12	39
43	13	17.6	17.9	18.1	18.3	18.5	18.7	18.9	19.1	19.3	20.2	13	43
46	14	17.9	18.1	18.3	18.5	18.7	19.0	19.2	19.3	19.5	20.5	14	46
49	15	18.1	18.4	18.6	18.8	19.0	19.2	19.4	19.6	19.8	20.7	15	49
52	16	18.4	18.6	18.8	19.0	19.2	19.5	19.7	19.8	20.0	21.0	16	52
56	17	18.7	19.0	19.2	19.4	19.5	19.8	20.0	20.2	20.3	21.3	17	56
59	18	18.9	19.2	19.4	19.6	19.8	20.0	20.2	20.4	20.6	21.5	18	59
62	19	19.1	19.4	19.6	19.8	20.0	20.3	20.4	20.6	20.8	21.8	19	62
66	20	19.4	19.7	19.9	20.1	20.3	20.5	20.7	20.9	21.1	22.0	20	66
72	22	19.9	20.1	20.3	20.5	20.7	21.0	21.2	21.3	21.5	22.5	22	72
79	24	20.3	20.6	20.8	21.0	21.2	21.4	21.6	21.8	22.0	22.9	24	79
85	26	20.7	21.0	21.2	21.4	21.6	21.8	22.0	22.2	22.4	23.3	26	85
92	28	21.2	21.4	21.6	21.8	22.0	22.3	22.4	22.6	22.8	23.8	28	92
98	30	21.5	21.8	22.0	22.2	22.4	22.6	22.8	23.0	23.2	24.1	30	98
115	35	22.5	22.7	22.9	23.1	23.3	23.6	23.8	24.0	24.1	25.1	35	115
131	40	23.3	23.6	23.8	24.0	24.2	24.4	24.6	24.8	25.0	25.9	40	131
148	45	24.2	24.4	24.6	24.8	25.0	25.3	25.5	25.6	25.8	26.8	45	148
164	50	24.9	25.2	25.4	25.6	25.8	26.0	26.2	26.4	26.6	27.5	50	164
180	55	25.6	25.9	26.1	26.3	26.5	26.7	26.9	27.1	27.3	28.2	55	180
197	60	26.3	26.6	26.8	27.0	27.2	27.5	27.6	27.8	28.0	29.0	60	197
213	65	27.0	27.3	27.5	27.7	27.9	28.1	28.3	28.5	28.7	29.6	65	213
230	70	27.7	27.9	28.1	28.3	28.5	28.8	29.0	29.1	29.3	30.3	70	230
246	75	28.3	28.6	28.7	28.9	29.1	29.4	29.6	29.7	29.9	30.9	75	246
262	80	28.9	29.1	29.3	29.5	29.7	30.0	30.1	30.3	30.5	31.5	80	262
279	85	29.5	29.7	29.9	30.1	30.3	30.6	30.8	30.9	31.1	32.1	85	279
295	90	30.0	30.3	30.5	30.7	30.9	31.1	31.3	31.5	31.7	32.6	90	295
312	95	30.6	30.9	31.1	31.3	31.4	31.7	31.9	32.1	32.2	33.2	95	312
328	100	31.1	31.4	31.6	31.8	32.0	32.2	32.4	32.6	32.8	33.7	100	328
361	110	32.2	32.4	32.6	32.8	33.0	33.3	33.5	33.6	33.8	34.8	110	361
394	120	33.2	33.4	33.6	33.8	34.0	34.3	34.4	34.6	34.8	35.8	120	394
427	130	34.1	34.4	34.6	34.8	35.0	35.2	35.4	35.6	35.8	36.7	130	427
459	140	35.0	35.3	35.5	35.7	35.9	36.1	36.3	36.5	36.6	37.6	140	459
492	150	35.9	36.2	36.4	36.5	36.7	37.0	37.2	37.3	37.5	38.5	150	492
525	160	36.7	37.0	37.2	37.4	37.6	37.8	38.0	38.2	38.4	39.4	160	525
558	170	37.6	37.8	38.0	38.2	38.4	38.7	38.9	39.0	39.2	40.2	170	558
591	180	38.4	38.6	38.8	39.0	39.2	39.5	39.7	39.8	40.0	41.0	180	591
623	190	39.1	39.4	39.6	39.8	40.0	40.2	40.4	40.6	40.8	41.8	190	623
656	200	39.9	40.2	40.4	40.6	40.8	41.0	41.2	41.4	41.5	42.5	200	656
722	220	41.4	41.6	41.8	42.0	42.2	42.5	42.7	42.8	43.0	44.0	220	722
787	240	42.8	43.0	43.2	43.4	43.6	43.9	44.0	44.2	44.4	45.4	240	787
853	260	44.1	44.4	44.6	44.8	45.0	45.2	45.4	45.6	45.8	46.7	260	853
919	280	45.4	45.7	45.9	46.1	46.3	46.5	46.7	46.9	47.1	48.0	280	919
984	300	46.6	46.9	47.1	47.3	47.5	47.7	47.9	48.1	48.3	49.2	300	984