

Younger children, may have difficulty in obtaining precise angle measurements with the Altitude Tracker. For simplicity's sake, round measurements off to the nearest 5 degree increment and read the altitude reached directly from the Altitude Calculator. If desired, you can

2. As a rocket launches, the person doing the tracking will follow the flight with the sighting tube on the tracker. The tracker should be held like a pistol and kept at the same level as the rocket when it is launched. Continue to



2. Once you determine the angle of the rocket, use the following equation to calculate altitude of the rocket:

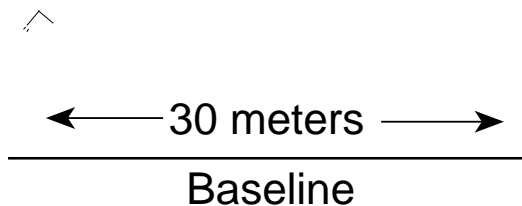
$$\textit{Altitude} = \tan \angle \times \textit{baseline}$$

Use a calculator with trigonometry functions to solve the problem or refer to the tangent table on page 86. For example, if the measured angle is 28 degrees and the baseline is 15 meters, the altitude is 7.97 meters.

$$\textit{Altitude} = \tan 28^\circ \times 15m$$

$$\textit{Altitude} = 0.5317 \times 15m = 7.97m$$

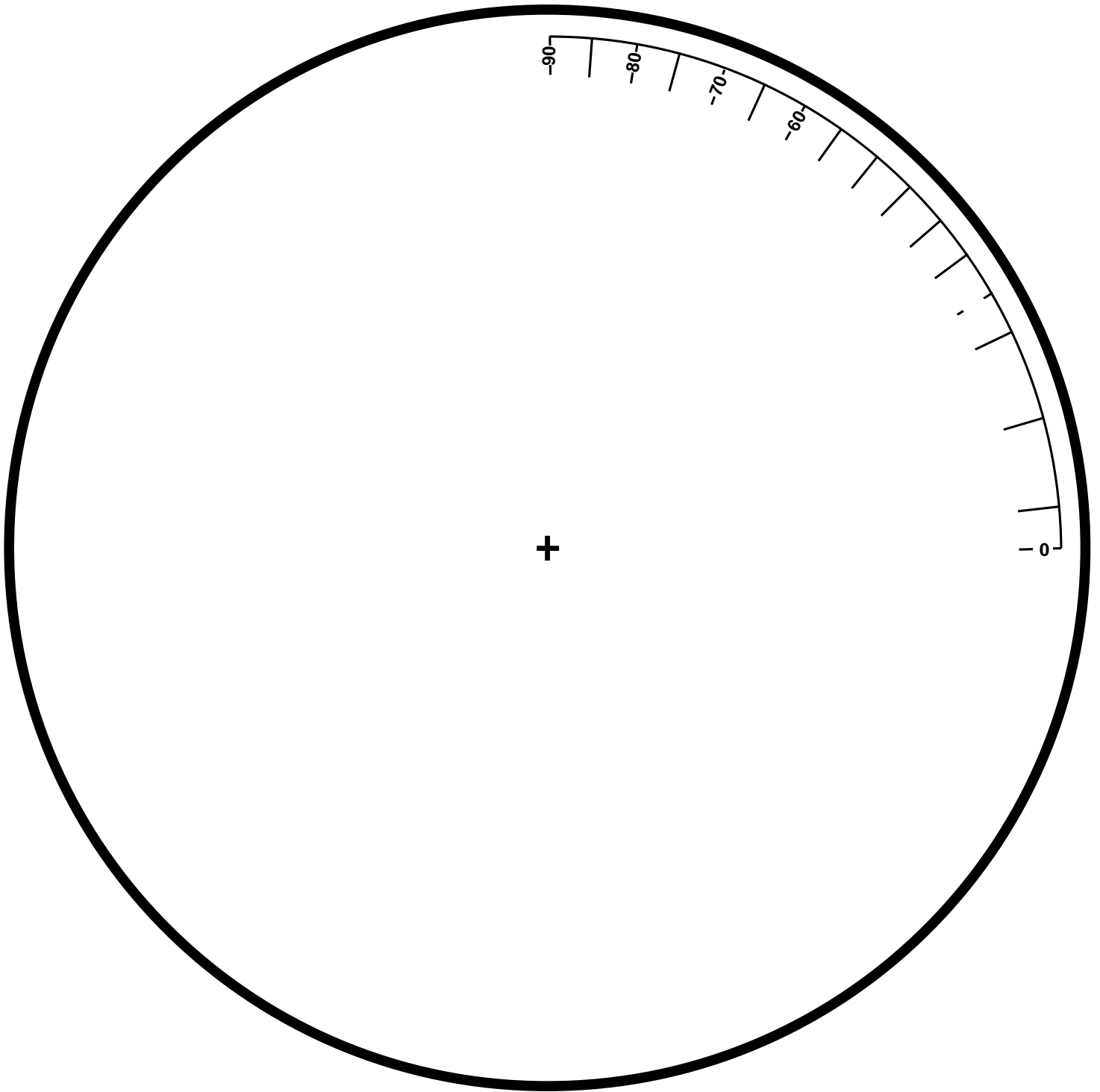
3. An additional improvement in accuracy can be obtained by using two tracking stations. Averaging the calculated altitude from the two stations will achieve greater accuracy. See the







Look at the number in the window for the distance of the tracking station location from the launch site. The number will tell you the altitude of the rocket in meters.



## Tangent Table

Degree	Tan	Degree	Tan	Degree	Tan
0	0.0000				
1	0.0174	31	0.6008	61	1.8040
2	0.0349	32	0.6248	62	1.8807
3	0.0524	33	0.6494	63	1.9626
4	0.0699	34	0.6745	64	2.0603
5	0.0874	35	0.7002	65	2.1445
6	0.1051	36	0.7265	66	2.2460
7	0.1227	37	0.7535	67	2.3558
8	0.1405	38	0.7812	68	2.4750
9	0.1583	39	0.8097	69	2.6050
10	0.1763	40	0.8390	70	2.7474
11	0.1943	41	0.8692	71	2.9042
12	0.2125	42	0.9004	72	3.0776
13	0.2308	43	0.9325	73	3.2708
14	0.2493	44	0.9656	74	3.4874
15	0.2679	45	1.0000	75	3.7320
16	0.2867	46	1.0355	76	4.0107
17	0.3057	47	1.0723	77	4.3314
18	0.3249	48	1.1106	78	4.7046
19	0.3443	49	1.1503	79	5.1445
20	0.3639	50	1.1917	80	5.6712
21	0.3838	51	1.2348	81	6.3137
22	0.4040	52	1.2799	82	7.1153
23	0.4244	53	1.3270	83	8.1443
24	0.4452	54	1.3763	84	9.5143
25	0.4663	55	1.4281	85	11.4300
26	0.4877	56	1.4825	86	14.3006
27	0.5095	57	1.5398	87	19.0811
28	0.5317	58	1.6003	88	28.6362
29	0.5543	59	1.6642	89	57.2899
30	0.5773	60	1.7320	90	-----