

# Saturn V Rocket Launch Speed and Height

Time (Sec)	Altitude (m)	Speed (m/s)
0	0	0
1	2	3
2	4	4
3	13	7
4	25	10
5	32	12
6	48	15
7	55	16
8	83	20
9	103	23
10	126	25
11	148	27
12	179	31
13	217	34
14	242	36
15	269	39
16	321	43
17	367	46
18	406	49
19	465	53
20	510	56



The Saturn V rocket carrying the Apollo-11 astronauts to the moon was launched from the Kennedy Space Center on July 16, 1969 at 9:32:00 a.m. (EDT) from launch pad 39A. It weighed 2,766,913 kg just before launch, and was 102 meters tall. The gantry was 106 meters tall. See the YouTube Video of the launch at [http://www.youtube.com/watch?v=F0Yd-GxJ\\_QM&feature=related](http://www.youtube.com/watch?v=F0Yd-GxJ_QM&feature=related)

**Problem 1** - Graph the speed of the rocket during the first 20 seconds after launch.

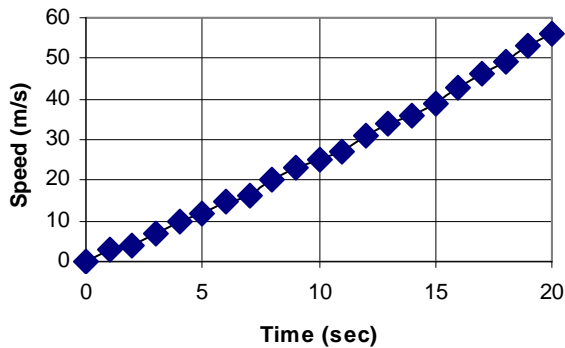
**Problem 2** - Graph the height of the rocket above the launch pad during the first 20 seconds after launch.

**Problem 3** - At what time did the bottom of the rocket just clear the top of the launch gantry?

**Problem 4** - How fast was the Saturn V traveling at the time the rocket engines just cleared the top of the gantry in A) meters/second? B) miles/hour?

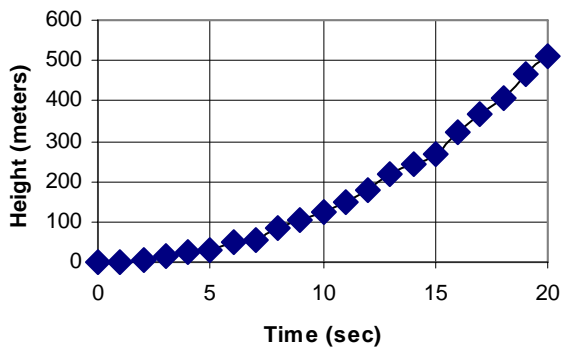
**Problem 1** - Graph the speed of the rocket during the first 20 seconds after launch.

Launch Speed versus Time



**Problem 2** - Graph the height of the rocket above the launch pad during the first 20 seconds after launch.

Rocket Height versus Time



**Problem 3** - At what time did the bottom of the rocket just clear the top of the launch gantry?

Answer: The gantry is 106 meters tall. The table, or graph, shows that at about **9 seconds**, the Saturn V rocket has an altitude of 103 meters, which is close to the gantry height.

**Problem 4** - How fast was the Saturn V traveling at the time the rocket engines just cleared the top of the gantry in A) meters/second? B) miles/hour?

Answer: A) At 9 seconds, the rocket was traveling at about 23 meters/sec.  
 B) Converting 23 meters/sec to miles/hr:

$23 \text{ meters/sec} \times (1 \text{ km} / 1000 \text{ meters}) \times (0.62 \text{ miles}/1 \text{ km}) \times (3600 \text{ sec}/1 \text{ hr}) = \mathbf{51 \text{ miles per hour.}}$