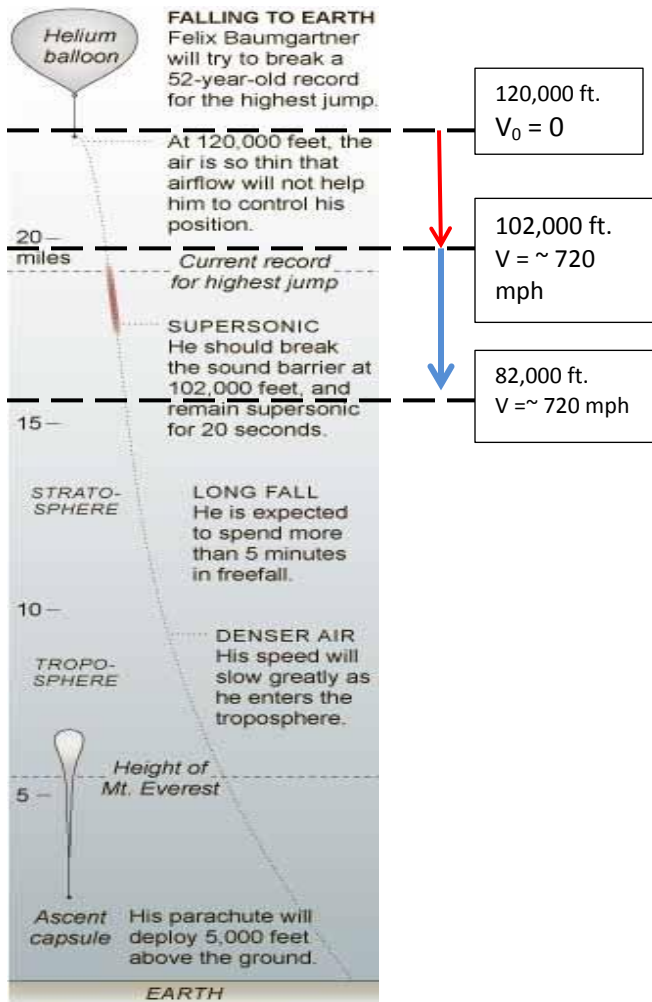


KINEMATICS

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1212 Rio Grande St., Austin Tx. 78701 jpcise@austincc.edu & NYTimes October 9,2012 by John Tierney

Daredevil Sets Sight on a 22-Mile Fall



Source: Red Bull Stratos Project

INTRODUCTION(((A))) 120,000 ft. to 102,000 ft. he was in free Fall.....no friction forces. That first 18,000 ft, it is said in the article, took 34 s.(((B)))From 102,000 ft. to ~82,000ft. he was traveling at ~720 mph(faster than speed of sound =690 mph).(((C))) This ~20,000 ft. from 102,000 ft. to 82,000 ft. was at a uniform ~720 mph it is stated in the article below. This ~20,000 ft fall took 20 s,...it is said.

QUESTION: (a) Show the initial 18,000 ft free fall took ~34 s?
(b) Show his speed after first ~34s was ~ 720 mph(as stated)?
(c) Show traveling at~720 mph (supersonic speed) for 20 s (between 102,000 ft. to 82,000 ft) he went a distance of about ~20,000 ft?

HINTS: $V = V_0 + at$, $X = V_0t + \frac{1}{2} a t^2$, $X = V_{\text{average}} t$,
 $60 \text{ mph} = 88 \text{ ft/s}$, $a=g=32 \text{ ft/s}^2$

Felix Baumgartner, a professional daredevil, plans to **step off a balloon-borne capsule 22 miles above Earth** on Tuesday morning and plummet for five and a half minutes until opening his parachute a mile above the New Mexico desert. If all goes as planned, he will do a series of barrel rolls in the near-vacuum of the stratosphere and **then plunge headfirst at more than 700 miles per hour**, becoming the first sky diver to break the sound barrier. After the bunny hop, Mr. Baumgartner hopes his body will slowly rotate so that he descends headfirst and breaks the 614-m.p.h. speed record held by Mr. Kittinger. **(((A)))After 34 seconds, engineers calculate, he will have fallen to 102,000 feet(fell 18,000 ft.) and accelerated beyond the speed of sound**(((B))), which at that altitude is close to 690 m.p.h. (the exact figure depends on the temperature) **(((B)))"I expect him to reach 720 miles per hour**(((C))), about Mach 1.1," said Art Thompson, the technical director of Red Bull Stratos and a former designer of the Stealth bomber **(((C)))**. **Mr. Baumgartner should remain supersonic for 20 seconds, until he reaches an altitude of 82,000 feet**(((D))). Then the thickening atmosphere should slow him to subsonic speed, and eventually to a terminal velocity of 120 miles per hour.