

60 miles high

My question was to find how long it would take to drop an object from 60 miles, high with no air resistance, and to find the speed it was going. To start, when you drop something it increases by 9.8 meters per second per second. This is, of course, after the first second because it has to take time to accelerate. At the end of the first second, the object would have fell 4.9 meters.

I started the problem by making a chart with the time, in seconds, and the speed. This was simple. $1 \cdot 9.8$, $2 \cdot 9.8$, $3 \cdot 9.8$ ect... If I knew how long it took, I would have been done. Since I don't, I have to find it. That is harder than it seems. Let's take a car. This car is going at 10 mph, never changes. To find how far it goes in 5 hours, you have to multiply the speed by the time. $5 \cdot 10 = 50$. Again, that is if the car is going at 10 mph, and never accelerates or decelerates.

Our object is constantly accelerating, so we can not use the car method. The method we will use though, is very similar. This is the equation: distance = time • average-speed. Now, if you do the math, you will find that 60 miles is roughly equal to 100,000 meters. Since we do not know the time, we have to modify the equation to fit our standards. I changed it to:

time = $\sqrt{(\square\square\square\square\square\square\square * 2)/9.8}$. Plug in 100,000 as distance, we get time = $\sqrt{20408}$. The square root of 20408 is 142, so the time = 142 seconds. In the first paragraph we learned that to find the speed, we have to multiply the time by 9.8. So, $142 \cdot 9.8 = 1391$. The answer to my question is that it will take 142 seconds (which is around 2.5 minutes), for an object to fall from an elevation of 60 miles with no air resistance, with an ending speed of 1391 meters per second.