

Title: Determining the time duration spent for an object at free fall when it is at its highest point

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Abstract: This article aims to specify accurately the time duration spent for an object at free fall when it is at its highest point, as well as violating the current physical value for this time duration.

Article:

Free fall objects undergo gravity force with gravity acceleration, it is obvious that the behavior of these object is governed by Newton laws of motion.

Free fall objects undergo only one force which is gravity" neglecting air resistance" , the net acceleration is g , this acceleration g can be derived from height and velocity equations using calculus.

Calculus fails at one point which determining the time duration for an object at its highest point, i.e. the time spent by an object thrown at 90 degrees angle while it is at stationary and its velocity is zero.

The standard definition for this time value is infinitely small which makes it undefined, but it is obvious and intuitive that the time spent by this object is zero seconds.

Calculus fails to determine this time value because both distance and time have zero value, no change in time and no change in distance.

The velocity graph of distance with respect to time give an idea that, at the highest point the velocity is zero which leads to a zero distance and a zero time, at the point that the velocity begins to increase downwards it will have a non-zero time and a non-zero distance they can be determined by the velocity equation.

An object at the highest point of free fall spends no time "zero seconds" while it is at stationary "not moving", this violates the current physical fact that an object at

the highest point during stationary spends a while and then starts to fall downwards.