**Answer #135**

**Part 1:**

The answer is (c): 2.00 seconds, as can be seen by clicking your mouse on the photograph below (well, almost).

The equation to determine how far an accelerated body moves as a function of time is:

\[ x = \frac{1}{2}a t^2. \]

where \( a \) is the acceleration.

The time for the accelerating body \( M \) to move the distance \( D \) between the two photocell gates due to the gravitational force on \( m \) is given by:

\[ t = \sqrt{\frac{2DM}{mg}} = t_0, \]

where \( g \) is the acceleration of gravity. Substituting \( 2M \) for \( M \) and \( 2m \) for \( m \) yields approximately \( t = t_0 \) or 2.00 seconds, reasonably close to the value obtained in the video.

**Part 2:**

The answer is (d): 2.00 seconds, as can be seen by clicking your mouse on the photograph below.
The equation to determine how far an accelerated body moves as a function of time is:

\[ x = \frac{1}{2} a t^2. \]

where \( a \) is the acceleration.

The time for the accelerating body \( M \) to move the distance \( D \) between the two photocell gates due to the gravitational force on \( m \) is given by:

\[ t = \sqrt{\frac{2DM}{mg}} = t_0, \]

where \( g \) is the acceleration of gravity. Substituting \( D/2 \) for \( D \) and \( 2M \) for \( M \), the factors of two cancel each other, yielding \( t = t_0 \) or approximately 2.00 seconds, reasonably close to the value obtained in the video.