

Griffith Example 1.2

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Question

Suppose someone drops a rock off a cliff of height h . As it falls, I snap a million photographs, at random intervals. On each picture I measure the distance the rock has fallen.

What is the average of all these distances? That is to say, what is the time average of the distance travelled?

Distance Formula

$$x(t) = \frac{1}{2}gt^2$$

$$g = 9.8067\text{ms}^{-2}$$

Velocity

$$x(t) = \frac{1}{2}gt^2$$

$$\frac{dx}{dt} = gt$$

Flight Time

Height: h ; Total Flight Time: T

$$h = \frac{1}{2}gT^2$$

$$\frac{2h}{g} = T^2$$

$$T = \sqrt{\frac{2h}{g}}$$

Random Intervals

David J. Griffiths and Darrell F. Schroeter. *Introduction to quantum mechanics*. Cambridge University Press Cambridge, United Kingdom, Cambridge, United Kingdom, third edition edition, 2018. ISBN 9781107189638; 1107189632; 9781108791106; 1108791107

