

Spring-2018 Phys101
Assignment 2

Please check MaterringPhysics for other problems

Due date: 21 Feb. 2018.

Note: Problems and questions refer to University Physics, By Young & Freedman, 14th edition

Discussion questions

1- Q2.2

2- Q2.4

3- Q2.6

4- Q2.9

5- Q2.22

6- In principle, can we measure the gravitational acceleration g by measuring distances only? I.e., in an experiment that does not involve time or velocity measurements? Discuss.

7- You are a field engineer in the desert, equipped with a stop watch. You encounter a water well of an unknown depth (suppose that the well is not so deep). Devise an approximate method to estimate the depth of a water well.

Problems

8- 2.4

9- 2.14

10- 2.24

11- A certain freely falling object requires 1.50 s to travel the last 30.0 m before it hits the ground. From what height above the ground did it fall?

12- 2.52

13- 2.53

14- 2.66

15- Galileo devised an odd-number rule describing falling objects. The rule may be stated as follows: If an object falling from rest drops a distance of 4.9 m the first second, it will fall 3×4.9 m during the second second, 5×4.9 m during the third second, 7×4.9 m during the fourth second, etc. Show that this leads to $x = 4.9 t^2$ where x is the total distance fallen in t seconds.

Hint: $\sum_{n=1}^N = N(N + 1)/2$