Exercise 46

Near the surface of the moon, the distance that an object falls is a function of time. It is given by $d(t) = 2.6667t^2$, where t is in seconds and $d(t)$ is in feet. If an object is dropped from a certain height, find the average velocity of the object from $t = 1$ to $t = 2$.

Solution

Calculate the average velocity of the object from $t = 1$ to $t = 2$.

$$\begin{aligned}\frac{d(2) - d(1)}{2 - 1}\ \frac{\text{ft}}{\text{s}} &= \frac{2.6667(2)^2 - 2.6667(1)^2}{1}\ \frac{\text{ft}}{\text{s}} \\ &= 2.6667(4) - 2.6667(1)\ \frac{\text{ft}}{\text{s}} \\ &= 8.0001\ \frac{\text{ft}}{\text{s}}\end{aligned}$$