Problems - HW 2

Tuesday, August 25

1. The graph of a function $f : (0, 1] \to \mathbb{R}$ is shown in figure 1 on the reverse.
   (a) Express $\int_0^1 f(x)\,dx$ as an infinite sum.
   (b) I wonder what the value of the sum is?
2. Suppose I drop a ball from a height of 1 meter. The ball bounces to height of 0.7 meters, then to a height of 0.49 meters, etc... always bouncing to a height of 0.7 times its previous height. How far does the ball travel?
3. Consider the function $f(x) = x^3$ over the interval $[1, 3]$.
   (a) What is the average slope of f over the interval?
   (b) Find the point c in $(1, 3)$ guaranteed by the mean value theorem.

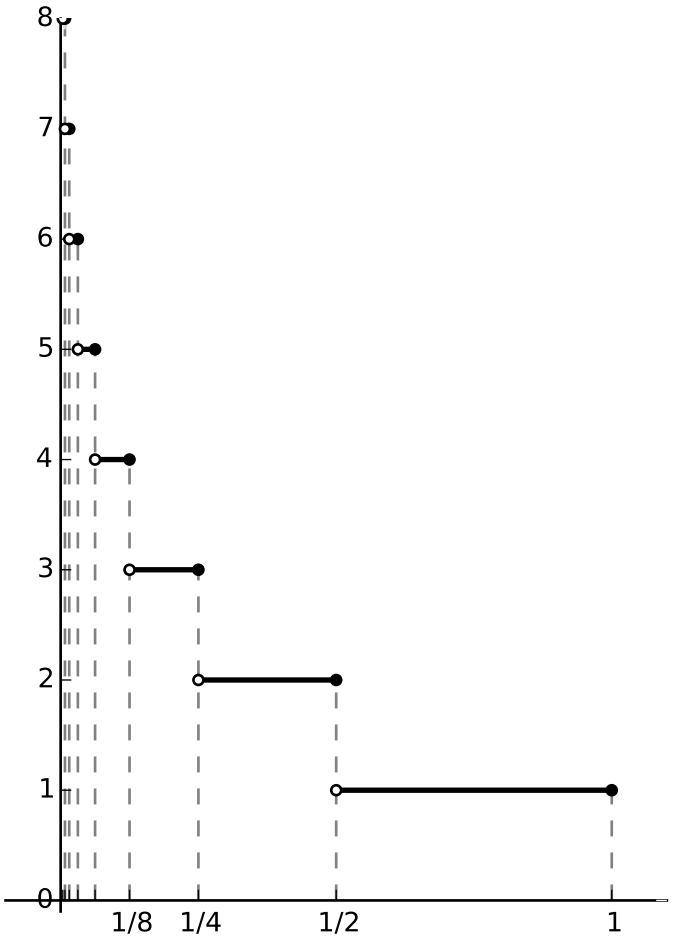

Figure 1: The graph for problem 1