

Problems - HW 2

Thursday, August 29

1. 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.
2. Starting from the geometric series formula, express

$$\sum_{n=1}^{\infty} n^2 x^n$$

as a rational function and use this to compute

$$\sum_{n=1}^{\infty} \frac{n^2}{2^n}.$$

3. The graph of a function $f : (0, 1] \rightarrow \mathbb{R}$ 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?

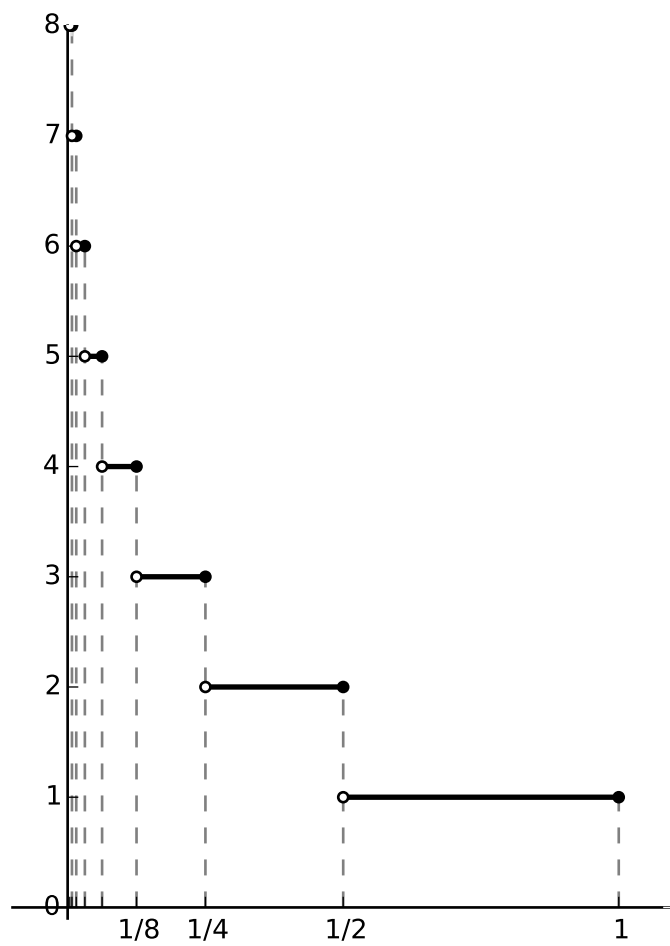


Figure 1: The graph for problem 1