

MATH 56A: STOCHASTIC PROCESSES WORKSHEET

3. WORKSHEET 3

The purpose of this worksheet is to practice the iteration algorithm, plot a convex value function and determine the optimal stopping time.

We have a simple random walk with states 0, 1, 2, 3, 4, 5 where the endpoints are absorbing. The payoff function is:

$$f = (0, 5, 5, 10, 4, 0)$$

- (1) Plot the function $f(x)$ and connects the dots.
- (2) Find the value function $v(x)$. This is the convex hull of the graph of $f(x)$.
- (3) Find the superharmonic

$$u_1(x) = \begin{cases} 0 & \text{if } x \text{ is absorbing} \\ \max f(y) & \text{if } x \text{ is transient} \end{cases}$$

- (4) Find u_2, u_3, \dots
- (5) Show that u_n converges to v as $n \rightarrow \infty$