

Solution for exercise 6.2.4 in Karlin and Pinsky

a)

$$\mu_i = (i)(M - N + i)^+\theta$$

Where $(x)^+ = \max\{0, x\}$

b)

$$\begin{aligned} E[W_N] &= \sum_{i=1}^N E[S_i] \\ &= \sum_{i=1}^N \frac{1}{\mu_i} \\ &= \sum_{i=1}^N \frac{1}{(i)(M - N + i)\theta} \end{aligned} \tag{1}$$