02407 Stochastic Processes 2011-9-22
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## Solution for exercise 5.4.7 in Karlin and Pinsky

The $W_{i}$ are iid, so we know from chapter 2 , equation 2.30

$$
\begin{aligned}
E\left[\sum_{i=0}^{X(t)} f\left(W_{i}\right)\right] & =E[X(t)] E\left[f\left(W_{1}\right)\right] \\
& =\lambda t E\left[f\left(W_{1}\right)\right] \\
& =\lambda \int_{0}^{t} f(w) d w
\end{aligned}
$$

