Dennis Kuzminer
CSCI-UA 310-001 PS6

3. $E[k] = E[X],\ X = X_1 + ... + X_k \rightarrow$ Each X has the same distribution, so for any X, the probability that a head will appear is p = .5. So, the *expected* number of coin tosses you make to get the ith head after you have already gotten i-1 heads is $\frac{1}{p} = 2.\ E[X] = E[X_1] + ... + E[X_k] \rightarrow$ $E[X] = \frac{1}{p} + ... + \frac{1}{p}$, k times. Meaning that $E[k] = \frac{k}{p}$. In this case, $p = .5,\ E[k] = \frac{k}{p} = 2k.$