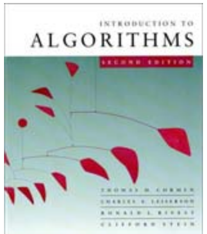

Calculating expectation

$$E[T(n)] = E\left[\sum_{k=0}^{n-1} X_k\bigl(T(k) + T(n-k-1) + \Theta(n)\bigr)\right]$$

$$= \sum_{k=0}^{n-1} E\bigl[X_k\bigl(T(k) + T(n-k-1) + \Theta(n)\bigr)\bigr]$$

$$= \sum_{k=0}^{n-1} E[X_k] \cdot E[T(k) + T(n-k-1) + \Theta(n)]$$

$$= \frac{1}{n}\sum_{k=0}^{n-1} E[T(k)] + \frac{1}{n}\sum_{k=0}^{n-1} E[T(n-k-1)] + \frac{1}{n}\sum_{k=0}^{n-1} \Theta(n)$$

Linearity of expectation; $E[X_k] = 1/n$.

