George throws two coins, A and B, at the same time. Coin A is biased so that the probability of obtaining a head is a. Coin B is biased so that the probability of obtaining a head is b, where $b < a$. The probability generating function of X, the number of heads obtained by George, is $G_X(t)$. The coefficients of t and t^2 in $G_X(t)$ are $\frac{5}{12}$ and $\frac{1}{12}$ respectively.

(a) Find the value of a. [2]

The random variable Y is the sum of two independent observations of X.

(b) Find the probability generating function of Y, giving your answer as a polynomial in t. [3]

(c) Find Var(Y). [3]