

The discrete random variable X has probability generating function $G_X(t)$ given by

$$G_X(t) = 0.2t + 0.5t^2 + 0.3t^3.$$

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

- (a)** Find the probability generating function of Y , giving your answer as an expanded polynomial in t . [3]
- (b)** Use the probability generating function of Y to find $E(Y)$ and $\text{Var}(Y)$. [5]