

The random variable  $Y$  is the sum of two independent observations of the random variable  $X$ . The probability generating function  $G_Y(t)$  of  $Y$  is given by

$$G_Y(t) = \frac{t^2}{(4 - 3t)^4}.$$

- (a) Find  $E(Y)$ . [3]
- (b) Write down an expression for the probability generating function of  $X$ . [1]
- (c) Find  $P(X = 4)$ . [3]