

## ST102 Class 9 – Additional exercises

1. A fair coin is tossed four times. Let  $X$  be the number of heads obtained on the first three tosses of the coin. Let  $Y$  be the number of heads on all four tosses of the coin.
  - (a) Find the joint probability distribution of  $X$  and  $Y$ .
  - (b) Find the mean and variance of  $X$ .
  - (c) Find the conditional probability distribution of  $Y$  given that  $X = 2$ .
  - (d) Find the mean of the conditional probability distribution of  $Y$  given that  $X = 2$ .
  
2.  $X$  and  $Y$  are independent and identically distributed uniform random variables, taking values 1, 2 and 3 only. Let  $W = X + Y$ .
  - (a) Find the mean of  $W$ .
  - (b) Find the variance of  $W$ .
  - (c) Find the moment generating function of  $W$ .