

The random variable  $X$  has probability density function  $f$  given by

$$f(x) = \begin{cases} \frac{1}{21}(x-1)^2 & 2 \leq x \leq 5, \\ 0 & \text{otherwise.} \end{cases}$$

- (a) Find the cumulative distribution function of  $X$ . [3]

The random variable  $Y$  is defined by  $Y = (X-1)^4$ .

- (b) Find the probability density function of  $Y$ . [3]

- (c) Find the median value of  $Y$ . [2]

- (d) Find  $E(Y)$ . [2]