

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]