

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

$$f(x) = \begin{cases} \frac{3}{4x^2} + \frac{1}{4} & 1 \leq x \leq 3, \\ 0 & \text{otherwise.} \end{cases}$$

**(i)** Find the distribution function of  $X$ . [3]

**(ii)** Find the exact value of the interquartile range of  $X$ . [5]