

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

$$f(x) = \begin{cases} \frac{1}{80} \left(3\sqrt{x} - \frac{8}{\sqrt{x}} \right) & 4 \leq x \leq 16, \\ 0 & \text{otherwise.} \end{cases}$$

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

The random variable Y is defined by $Y = \sqrt{X}$.

(ii) Find the probability density function of Y . [3]