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

$$f(x) = \begin{cases} \frac{1}{8} & 0 \le x < 1, \\ \frac{1}{28}(8-x) & 1 \le x \le 8, \\ 0 & \text{otherwise.} \end{cases}$$

- (a) Find the cumulative distribution function of X. [3]
- **(b)** Find the value of the constant a such that  $P(X \le a) = \frac{5}{7}$ . [3]

The random variable Y is given by  $Y = \sqrt[3]{X}$ .

(c) Find the probability density function of *Y*. [5]