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

$$f(x) = \begin{cases} \frac{4}{9}(x+1) & 0 \leqslant x \leqslant 1, \\ (x-2)^2 & 1 < x \leqslant 2, \\ 0 & \text{otherwise.} \end{cases}$$

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

(b) Find the exact value of the median of X. [2]

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

(c) Find the cumulative distribution function of Y. [3]

(d) Determine whether the median of Y is greater than, or less than, the median of X. [2]