

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

$$f(x) = \begin{cases} k & 0 \leq x < 1, \\ kx & 1 \leq x \leq 2, \\ 0 & \text{otherwise,} \end{cases}$$

where  $k$  is a constant.

- (a) Show that  $k = \frac{2}{5}$ . [1]
- (b) Find the interquartile range of  $X$ . [5]
- (c) Find  $\text{Var}(X)$ . [4]