

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

$$f(x) = \begin{cases} kx(4-x) & 0 \leq x < 2, \\ k(6-x) & 2 \leq x \leq 6, \\ 0 & \text{otherwise,} \end{cases}$$

where k is a constant.

- (a) Show that $k = \frac{3}{40}$. [1]
- (b) Given that $E(X) = 2.5$, find $\text{Var}(X)$. [3]
- (c) Find the median value of X . [4]