

**CALCULATOR**

[1] The probability density function for a random variable  $X$  is defined by  $f(x) = \begin{cases} \frac{4x^3}{c}, & 1 \leq x \leq 4 \\ 0, & \text{elsewhere} \end{cases}$ .

[a] Find the value of  $c$ .

[b] Find  $E(X)$ .

[c] Find  $\text{Var}(X)$

[d] Find the median value of  $X$ .

[e] Find  $P(2 < X < 3)$

**NO CALCULATOR**

[2] The probability density function for a random variable  $Y$  is defined by  $g(x) = \begin{cases} 3x^2, & 0 \leq x \leq 1 \\ 0, & \text{elsewhere} \end{cases}$ .

[a] Find the variance of  $Y$ .

[b] Find  $P\left(0 < X < \frac{1}{2}\right)$