Question Number	Scheme	Marks
2 (a)	$\mathrm{f}(x) = \begin{cases} \frac{1}{4k} & -k \leqslant x \leqslant 3k \\ 0 & \text{otherwise} \end{cases}$	M1 A1
		(2)
(b)	$[\mathrm{E}(X)] = k$	B1
		(1)
(c)	$[\mathrm{Var}(X)] = \frac{(3k - -k)^2}{12} = \frac{16k^2}{12}$ or $\left[\frac{x^3}{3}\ "\mathrm{f}(x)"\right]_{-k}^{3k} - ("k")^2$	M1
	$= \frac{4k^2}{3}$*	A1* cso
		(2)
(d)	$\mathrm{E}(X^2) = \mathrm{Var}(X) + \mathrm{E}(X)^2 = \frac{4k^2}{3} + ("k")^2$	M1
	$= \frac{7k^2}{3}$	A1
	$\mathrm{E}(3X^2) = 3\mathrm{E}(X^2) = 3 \times \frac{7k^2}{3} = 7k^2$	A1
		(3)

	Notes	**Total 8**
2 (a)	**M1**	For the 1st line of the pdf including the inequality, allow use of < instead of one/both $\leq$ signs
	A1	Fully correct, allow use of < instead of one/both $\leq$ signs. Allow equivalent for the 0 otherwise.
(b)	**B1**	Cao
(c)	**M1**	Use of $\mathrm{Var}(X) = \frac{(\beta - \alpha)^2}{12}$ or $\left[\frac{x^3}{3}\ "\mathrm{f}(x)"\right]_{-k}^{3k} - ("k")^2$
	A1* cso	Answer is given. Correct solution only with no incorrect working.
(d)	**M1**	Use of $\mathrm{E}(X^2) = \mathrm{Var}(X) + \mathrm{E}(X)^2$ ft their E(X) or $\left[\frac{x^3}{3}\ "\mathrm{f}(x)"\right]_{-k}^{3k}$ this integration may be seen in part (c) or part (d)
	A1	$\frac{7k^2}{3}$ (This must be seen in part (d)) May be implied by $7k^2$)
	A1	Cao