Question Number	Scheme	Marks
5. (a)	{E(X) = } $-2a - b + 0\times c + b + 4a$ or $2a$	M1
	{ $2a = 0.5$ so } **$a = 0.25$**	A1
		(2)
(b)	{ E(X^2) =} $(-2)^2 \times a + (-1)^2 \times b + 0 + 1^2 \times b + 4^2 \times a$ or $20a + 2b$ (o.e.)	M1
	{Var(X) =}"$20a + 2b$" $- 0.5^2$	M1
	$20a + 2b - 0.25 = 5.01$ (o.e.) e.g. "4.75" $+ 2b = 5.01$	A1
	{ $2b = 0.26$ so } **$b = 0.13$**	A1
	{Use of sum of probs = 1 to calculate a 2nd value} **$c = 0.24$**	A1ft
		(5)
(c)(i)	{E(Y) $= 5 - 8\times 0.5$ } = **1**	B1
(ii)	{Var(Y) =} $(-8)^2 \times 5.01$	M1
	= 320.64 awrt **321**	A1
		(3)
(d)	$4X^2 > 5 - 8X$	M1
	$(2X-1)(2X+5) > 0 \Rightarrow X > 0.5$	M1A1
	So need $X = 1$ or 4 or probability of $a + b$	M1
	= **0.38**	A1
		(5)
		[15 marks]

	Notes	
(a)	M1	for any correct expression for E(X) in terms of a (or a, b, c)
	A1	for $a = 0.25$
(b)	1st M1	for attempt at an expression for E(X^2) with at least 3 correct non-zero terms
	2nd M1	for a correct expression for Var(X) eg"$18a - c + 1$" $- 0.5^2$ Allow with their value of a substituted
	1st A1	for a correct equation for b (or possibly c) eg"$18a - c + 1$" $- 0.5^2 = 5.01$ Allow with their value of a substituted
	2nd A1	for either $b = 0.13$ or $c = 0.24$
	3rd A1ft	for using $c = 1 - 2\times$"0.25" $- 2\times$"0.13" or $b = (1 - 2\times$"0.25" $-$"0.24" $)\div 2$ to gain the correct ft answer for their 2nd value
(c)	B1	for {E(Y) =} 1
	M1	for correct use of Var($aX + b$) = a^2 Var (X)
	A1	for awrt 321
(d)	1st M1	for correct quadratic inequality (may be inside prob statement) or table of values
	2nd M1	for an attempt to solve or identifying correct X values
	1st A1	for $X > 0.5$ [may also have $X < -2.5$]
	3rd M1	for realising need $X = 1$ and 4 only or answer of their ($a + b$)
	2nd A1	for 0.38 (or exact equivalent) only (correct ans only 5/5)