Question Number	Scheme	Marks
4(a)	$0.05 + 0.1 + a + b + 0.35 = 1$ [$a + b = 0.5$]	M1
	$-0.05 + a + 2b + 1.05 = 1.8$ [$a + 2b = 0.8$]	M1
	$b = 0.3$ $a = 0.2$	A1
		(3)
(b)	<table><tr><td>[x]</td><td>−1</td><td>0</td><td>1</td><td>2</td><td>3</td></tr><tr><td>[F(x)]</td><td>0.05</td><td>0.15</td><td>0.35</td><td>0.65</td><td>1</td></tr></table>	B1B1ft
		(2)
(c)	0.15	B1
		(1)
(d)	$\mathrm{E}(X^2) = 1\times0.05 + 1\times"0.2" + 4\times"0.3" + 9\times0.35[= 4.6]$	$\mathrm{E}(5-3X) = 8\times0.05 + 5\times0.1 + 2\times"0.2" - 1\times"0.3" - 4\times0.35[= -0.4]$ or $\mathrm{E}(5-3X) = 5 - 3\times1.8[= -0.4]$ M1
	$\mathrm{Var}(X) = "4.6" - 1.8^2 = 1.36$	$\mathrm{E}(5-3X)^2 = 64\times0.05 + 25\times0.1 + 4\times"0.2" + 1\times"0.3" + 16\times0.35[= 12.4]$ M1
	Var(5 – 3X) = 9 × "1.36" = 12.24	Var(5 – 3X) = "12.4" – ("−0.4")^2 = 12.24 M1
	awrt **12.2**	A1
		(4)

	Notes	Total 10
(a)	**M1**	for either correct equation in a and b
	M1	for both correct equations in a and b
	A1	both $a = 0.2$ oe and $b = 0.3$ oe correct answers score 3 out of 3 unless from obvious incorrect working
In part (b) and (d) working labelled in script takes priority. Look out for working shown under the table which can be marked if it does not contradict the working in the script.		
(b)	**B1**	for 3 correct values of x and their associated cumulative probabilities
	B1ft	for a fully correct cdf ft their a and b provided both are probabilities and $a + b = 0.5$
(c)	**B1**	0.15 oe
(d)	**M1**	for method to find $\mathrm{E}(X^2)$ with at least 3 correct (ft) non-zero products (may be implied by 4.6) only allow ft products which use **probabilities** or a method to find E(5 – 3X) with at least 3 correct (ft) non-zero products (may be implied by −0.4) or use of E(5 – 3X) = 5 – 3E(X)
	M1	for a correct method to find Var(X) ft their $\mathrm{E}(X^2)$ (may be implied by 1.36) or a correct method to find E(5 – 3X)^2 (may be implied by 12.4)

	M1	for use of $3^2\text{Var}(X)$ ft their Var(X) or use of E(5 – 3X)^2 – (E(5 – 3X))^2
	A1	awrt 12.2 working must be shown Answer only send to review.