Question Number	Scheme		Marks
6 (a)	$[A=]X(20-X)=20X-X^2$		M1
	$[\mathrm{E}(X)=]10$	$[\mathrm{E}(A)=]\frac{1}{20}\int_{[0]}^{[20]} 20x-x^2\,\mathrm{d}x$	B1
	$[\mathrm{Var}(X)=]\frac{100}{3}$	$[\mathrm{E}(A)=]\frac{1}{20}\left[10x^2-\frac{1}{3}x^3\right]_{[0]}^{[20]}$	B1
	$\mathrm{E}(X^2)=10^2+\frac{100}{3}\left[=\frac{400}{3}\right]$	Correct limits 0 and 20	M1
	$\mathrm{E}(A)=20\times 10-"\frac{400}{3}"$	$\mathrm{E}(A)=\frac{1}{20}\left(10(20^2)-\frac{1}{3}(20^3)-0\right)$	M1
		$=\frac{200}{3}$	A1
			(6)
(b)	$\left[\mathrm{P}\left(A>5X^2\right)=\right]\mathrm{P}\left("20X-X^2">5X^2\right)$		M1
	$\Rightarrow \mathrm{P}\left(X<\frac{10}{3}\right)$		M1
	$\frac{1}{20}\times"\frac{10}{3}"$		M1
	$=\frac{1}{6}$		A1
			(4)
			Total 10

		Notes
(a)	**M1**	For a correct expression for area
	B1	For 10 or correct expression for E(*A*) ignore limits
	B1	For $\frac{100}{3}$ or fully correct integration
	M1	For use of $\mathrm{E}(X^2)=\mathrm{E}(X)^2+\mathrm{Var}(X)$ ft their E(*X*) and Var(*X*) or correct limits seen or used
	M1	For use of $20\mathrm{E}(X)-\mathrm{E}(X^2)$ ft their E(*X*) and E(X^2) or complete numerical expression for E(*A*)
	A1	Allow awrt 66.7
(b)	**M1**	For $"20X-X^2">5X^2$ Allow = ft their area which must be in terms of *X*
	M1	For rearranging and attempting to solve $"20X-X^2">5X^2$ May be implied by $\frac{10}{3}$
	M1	For correct area $\frac{1}{20}\times"\frac{10}{3}"$
	A1	Allow awrt 0.167