Question Number	Scheme	Marks
6. (a)	$P(17 < W < k) = P(W < k) - P(W < 17) = \frac{53}{60} - \left(1 - \frac{1}{5}\right) = \frac{1}{12}$	M1 A1 (2)
(b)(i)	$\frac{(b-a)^2}{12} = 75$, $\frac{b-17}{b-a} = \frac{1}{5}$ or $\frac{17-a}{b-a} = \frac{4}{5}$	B1, B1
	$\frac{(b-a)^2}{12} = 75 \rightarrow (b-a) = 30$ $\frac{b-17}{30} = \frac{1}{5}$	M1
	$b = 23$ and $a = -7$	A1 (4)
(ii)	$P(W < k) = \frac{k-("-7")}{"23"-("-7")} = \frac{53}{60}$ or $P(17 < W < k) = \frac{k-17}{30} = \frac{1}{12}$ or $P(W > k) = \frac{"23"-k}{"23"-("-7")} = \frac{7}{60}$	M1
	$k = 19.5$	A1 (2)
(c)	$P(-5 < W < 5) = \frac{5-(-5)}{"23"-("-7")} = \frac{1}{3}$	M1A1ft (2)
(d)	$E(W^2) = Var(W) + E(W)^2 = 75 + \left(\frac{"23"+"-7"}{2}\right)^2 = 139$	M1 A1 (2) **[Total 12]**

	Notes
(a)	M1 for writing or using $P(W < k) - P(W < 17)$ allow < or $\leqslant$
	Allow equivalent expressions e.g. $P(W > 17) - P(W > k) = \frac{1}{5} - \left(1 - \frac{53}{60}\right)$
	A1 oe condone awrt 0.0833 condone $\frac{1}{12}$ coming from $\frac{13}{12} - 1$ or $\left\lvert -\frac{1}{12} \right\rvert$
(b) (i)	1st B1 correct equation for variance
	2nd B1 either correct probability equation Allow e.g. k in place of $(b - a)$
	1st M1 eliminating $(b - a)$ which must appear in both equations.
	A1 both $b = 23$ and $a = -7$ correct answers imply all 4 marks
(ii)	M1 probability expression using uniform distribution ft their values
	A1 $k = 19.5$ oe cao
(c)	M1 for 10/(their b – their a)
	A1ft $\frac{1}{3}$ oe condone awrt 0.333 (Allow ft $\frac{10}{their(b-a)}$ as exact fraction or evaluated to 3sf or better provided $a < -5$ and $b > 5$)
(d)	M1 use of $E(W^2) = Var(W) + (E(W))^2$ with values substitued for $Var(W)$ and $E(W)$
	ft their values of a and b allow any rearrangement. Must have a correct (ft) expression or value for $E(W)$
	Also allow $\int_{"-7"}^{"23"} \frac{1}{"23"-"-7"} w^2 dw$
	A1 139 cao