Question Number	Scheme	Marks
5(a)	$\left[\dfrac{24.7034+26.8966}{2}=\right]25.8$	B1 (1)
(b)	$26.8966-24.7034=2\times1.6449\times\dfrac{\sigma}{\sqrt{36}}$ oe or $26.8966-"25.8"=1.6449\times\dfrac{\sigma}{\sqrt{36}}$ oe or $"25.8"-24.7034=1.6449\times\dfrac{\sigma}{\sqrt{36}}$ oe	M1B1
	$\dfrac{6(26.8966-24.7034)}{2(1.6449)}=\sigma$ oe or $\dfrac{6(26.8966-25.8)}{1.6449}=\sigma$ oe or $\dfrac{6(25.8-24.7034)}{1.6449}=\sigma$ oe or $\dfrac{3.2898}{6}\sigma=2.1932$ oe or $\dfrac{\sigma}{6}=\dfrac{2}{3}$ oe leading to $\sigma=4$*	A1*
		(3)
(c)	$2\times z\times\dfrac{4}{\sqrt{36}}=1.6$ oe	M1
	$z=1.2$	A1
	$P(Z>1.2)=0.1151$ or $P(Z<1.2)=0.8849$	M1
	Confidence level = $100\times(1-2\times0.1151)$ or $100\times(2\times0.8849-1)$	M1
	= 77 awrt 77	A1
		(5)
(d)	$2\times1.6449\times\dfrac{4}{\sqrt{n}}<0.6$ oe	M1
	$\sqrt{n}>\dfrac{8\times1.6449}{0.6}\left[\Rightarrow\sqrt{n}=21.932\right]$ or $\sqrt{n}>\dfrac{8\times1.64485...}{0.6}\left[\Rightarrow\sqrt{n}=21.9313...\right]$	dM1
	n = 481.01… so n = 482 or n = 480.98… so n = 481	A1
		(3)
	Notes	**Total 12**

Mark parts (a) and (b) together		
(a)	**B1**	Cao
(b)	**M1**	for $26.78-24.82=2\times z$ value$\times\dfrac{\sigma}{\sqrt{36}}$ oe or $26.78-"25.8"=z$ value$\times\dfrac{\sigma}{\sqrt{36}}$ oe or $"25.8"-24.82=z$ value$\times\dfrac{\sigma}{\sqrt{36}}$ oe ft their 25.8
	B1	1.6449 or better
	A1*cso	at least one line of working from M1 to the given answer with no incorrect working seen (Allow 4.00)
(c)	**M1**	for $2\times z\times\dfrac{4}{\sqrt{36}}=1.6$ may be implied by z = 1.2
	A1	z = 1.2
	M1	for $P(Z>1.2)=0.1151$ or $P(Z<1.2)=0.8849$ ft their z may be implied by 0.7699 or awrt 77

	M1	for $100\times(1-2\times0.1151)$ ft their 0.1151 or $100\times(2\times0.8849-1)$ ft their 0.8849 May be implied by awrt 77
	A1	Awrt 77
(d)	**M1**	for $2\times z$ value $\times\frac{4}{\sqrt{n}}<0.6$ z value must either be correct or consistent with part (b) Condone = or $\leqslant$
	dM1	dependent on previous M mark. Correct rearrangement to get $\sqrt{n}>...$ or $n>\ldots$ Condone = or $\geqslant$
	A1	$n = 482$ or $n = 481$ (Must be clear that their answer matches their working)

Question Number	Scheme	Marks
6(a)	[Continuous] uniform on the interval [0, 15]	B1
		(1)
(b)	mean = 7.5	B1
	standard deviation = $\sqrt{\frac{(15-0)^2}{12}}$	M1
	$\frac{15}{\sqrt{12}} = 4.330...$	A1
		(3)
(c)	By the CLT $\overline{T} \sim \mathrm{N}\left(7.5,\ \frac{3}{8}\right)$	M1
	$\mathrm{P}\left(7.2 < \overline{T} < 7.8\right) = \mathrm{P}\left(\frac{7.2-"7.5"}{\sqrt{"\frac{3}{8}"}} < Z < \frac{7.8-"7.5"}{\sqrt{"\frac{3}{8}"}}\right) = \left[\mathrm{P}\left(-0.49 < Z < 0.49\right)\right]$	M1A1
	= 0.6879 – (1 – 0.6879) (Calculator gives 0.68789…)	M1
	= 0.3758 (Calculator gives 0.37579…) awrt 0.376	dA1
		(5)

	Notes		Total 9
(a)	**B1**	for the correct distribution stated (need uniform and correct interval) Allow U[0, 15] Condone U(0, 15) Must be seen in part (a)	
(b)	**B1**	Cao	
	M1	for a correct method for finding the standard deviation	
	A1	awrt 4.33 Condone $\frac{5\sqrt{3}}{2}$	
(c)	**M1**	for writing or using $\mathrm{N}\left(7.5,\ \frac{3}{8}\right)$ oe May be seen in a correct standardisation	
	M1	for standardising using either 7.2 or 7.8 and their mean and standard deviation. The standardisation must be shown for this mark	
	A1	for a fully correct expression for either 7.2 or 7.8. May be implied by ± awrt 0.49	
	M1	for $p - (1 - p)$ or $2(p - 0.5)$ oe	
	dA1	Dep on 2nd M mark for awrt 0.376	