Question Number	Scheme	Marks
5(a)(i)	$\mathrm{P}(S > 640) = \mathrm{P}\left(Z > \dfrac{640-700}{50}\right)$	M1
	awrt **0.885**	A1 (2)
(ii)	$675 < S < 725$	M1
	$\mathrm{P}(675 < S < 725) = \mathrm{P}(S < 725) - \mathrm{P}(S < 675)$ **or** use of symmetry to find correct area	M1
	$\mathrm{P}(S < 725) = \mathrm{P}\left(Z < \dfrac{725-700}{50}\right)$ or $\mathrm{P}(S < 675) = \mathrm{P}\left(Z < \dfrac{675-700}{50}\right)$	M1
	$\mathrm{P}(-0.5 < Z < 0.5) = 0.6915 - (1 - 0.6915)$ or $1 - 2\times 0.3085$ or $2\times(0.6915 - 0.5)$	A1
	$= 0.383$ awrt **0.383**	A1
		(5)
(b)(i)	$\dfrac{680-\mu}{\sigma} = 1.5$ $\dfrac{599-\mu}{\sigma} = -0.5244$	M1A1 A1
		(3)
(ii)	$(680-\mu) - (599-\mu) = 1.5\sigma - (-0.5244)\sigma$	M1
	$(81 = 2.0244\sigma)$	
	$\sigma = 40.01185$ $\mu = 619.98....$ awrt **40** (to 2sf) awrt **620** (to 3sf)	A1A1
		(3)
		Total 13

(a)(i)	**M1**	Attempt to standardise with 640, 700 and 50 allow ± (**not** implied by ±1.2 on its own)
	A1	awrt 0.885 (calc gives 0.884930…) answer only is M0A0 must see standardisation do not isw if 1 – 0.8849 is then found
(ii)	**M1**	Sight of 675 or 725
	M1	Use of $\mathrm{P}(675 < S < g) = \mathrm{P}(S < g) - \mathrm{P}(S < 675)$ where $724 \text{„} g \text{„} 725$ **or** correct use of symmetry eg $\mathrm{P}(675 < S < 725) = 2(\mathrm{P}(S < 725) - 0.5)$ or eg $\mathrm{P}(675 < S < 725) = 1 - 2\mathrm{P}(S < 675)$
	M1	One correct standardisation seen of 675 or g with 700 and 50 where $724 \text{„} g \text{„} 725$ Allow for just ± 0.5 oe seen as a z-value (not a probability)
	A1	(dep on 3rd M1) sight of awrt 0.69 or awrt 0.31
	A1	(dep on 3rd M1) awrt 0.383
	SC Use of 650 and 750	Use of 650 and 750 scores a maximum of 4 out of 5 [**Must be 650 and 750** to apply SC] M0 M1 Use of $\mathrm{P}(650 < S < 750) = \mathrm{P}(S < 750) - \mathrm{P}(S < 650)$ or use of symmetry to find correct area M1 standardising 650 or 750 with 700 and 50 or just ±1 seen as a z –value (not a probability) A1 (dep on 3rd M1) sight of awrt 0.84 or awrt 0.16 A1 (dep on 3rd M1) awrt 0.683
		Mark parts (b)(i) and (b)(ii) together
(b)(i)	**M1**	$\pm\dfrac{680-\mu}{\sigma} = z$ with $1 < \lvert z\rvert < 2$ **or** $\pm\dfrac{599-\mu}{\sigma} = z$ with $0.5 < \lvert z\rvert < 0.6$
	A1	1 correct equation with $z = 1.5$ or better (calc gives 1.5000556…) or $z = -0.5244$ or better (calc gives –0.5244004…)
	A1	Both equations correct require both 1.5 or better **and** –0.5244 or better
(ii)	**M1**	Attempt to eliminate μ or σ from the 2 equations (implied by awrt $\mu = 620$ and awrt $\sigma = 40$)
	A1	awrt $\mu = 620$ (3sf) **or** awrt $\sigma = 40$ (2sf)
	A1	awrt $\mu = 620$ (3sf) **and** awrt $\sigma = 40$ (2sf)