Question	Answer	Marks	Guidance
(a)	$\mathrm{P}(46 < X < 62) = \mathrm{P}\left(\frac{46-55}{6} < Z < \frac{62-55}{6}\right)$	**M1**	46 or 62, 55 and 6 substituted into ±standardisation formula once. Condone 6^2 and continuity correction ±0.5
	$= \mathrm{P}\left(-1.5 < Z < \frac{7}{6}\right)$	**B1**	Both standardisation values correct, accept unsimplified
	$\left[=\Phi\left(\frac{7}{6}\right)-\left(1-\Phi(1.5)\right)\right]$ $= 0.8784 + (0.9332 - 1)$	**M1**	Calculating the appropriate area from stated Φs of z-values, must be probabilities.
	0.812	**A1**	$0{\cdot}8115 < p \leqslant 0{\cdot}812$
		4	
(b)	$z = \pm 0.674$	**B1**	CAO, critical z-value
	$\frac{36-42}{\sigma} = -0.674$	**M1**	36 and 42 substituted in ±standardisation formula, no continuity correction, not σ^2, $\sqrt{\sigma}$, equated to a z-value
	$\sigma = 8.9[0]$	**A1**	WWW. Only dependent on M.
		3	

Question	Answer	Marks	Guidance
(c)	P(male < 46) = 1−*their* 0.9332 = 0.0668	**M1**	FT value from part **(a)** or Correct: $1-\Phi\left(\frac{46-55}{6}\right)$,condone continuity correction, σ^2, $\sqrt{\sigma}$, **and** probability found. Condone unsupported correct value stated.
	P(female < 46) = P($Z < \frac{46-42}{\textit{their}\,8.90}$) $\left[=\Phi(0.449)\right]$ $= 0.6732$	**M1**	46, 42 and *their* 4(b) σ (or correct σ) substituted in ±standardisation formula, condone continuity correction, σ^2, $\sqrt{\sigma}$, **and** probability found Condone $\frac{4}{\textit{their}\,8.90}$.
	P(both) = 0.0668 ×0.6732	**M1**	Product of *their* 2 probabilities (0 < both < 1) Not 0.25 or *their* final answer to **4(a)** used.
	0.0450 or 0.0449	**A1**	$0{\cdot}0449 \leqslant p \leqslant 0{\cdot}0450$
		4	