Question	Answer	Marks	Guidance
(a)	$[\mathrm{P}(142 < X < 205)] = \mathrm{P}\left(\frac{142-170}{25} < z < \frac{205-170}{25}\right)$	**M1**	Use of ± standardisation formula once substituting 170, 25 and either 142 or 205 appropriately.. Condone 25^2 and continuity correction ±0.5.
	$\mathrm{P}(-1.12 < z < 1.4)$	**A1**	Both correct. Accept unsimplified.
	$\Phi(1.4) - (1 - \Phi(1.12)) = 0.9192 + 0.8686 - 1$	**M1**	Calculating the appropriate area from stated phis of z-values.
	0.788	**A1**	AWRT, not from wrong working
		4	
(b)	$\mathrm{P}(X > 205) = 1 - 0.9192 = 0.0808$	**B1 FT**	Correct or FT from part **5(a).**
	$(0.0808 \times 0.30 + \textit{their}\ 0.788 \times 0.24) \times 20000$	**M1**	Correct or *their* 0.0808 × 0.30 × k + *their* 0.788 × 0.24 × k, k positive integer.
	[$]4266.24	**A1**	4265 < income ⩽ 4270, not from wrong working
		3	
(c)	$[\mathrm{P}(Z > \frac{w-182}{20}) = 0.72]$	**B1**	0.5828 ⩽ z ⩽ 0.583 or -0.583 ⩽ z ⩽ –0.5828 seen.
	$\frac{w-182}{20} = -0.583$	**M1**	182 and 20 substituted in ± standardisation formula, no continuity correction, not σ^2, $\sqrt{\sigma}$, equated to a z-value.
	$w = 170$	**A1**	170 ⩽ w < 170.35
		3	