Question Number	Scheme	Marks
3(a)	$\mathrm{P}(X<40)=\mathrm{P}\left(Z<\dfrac{40-42}{5}\right)=\mathrm{P}(Z<-0.4)$	M1
	$=1-0.6554$	M1
	$=0.3446$ awrt **0.345**	A1
		(3)
(b)	P(Qualify) $=1-("0.3446")^3$ or $(1-"0.3446")+("0.3446")(1-"0.3446")+("0.3446")^2(1-"0.3446")$ [$q=0.9590\ldots$ full calc: 0.9590867…]	M1
	$\mathrm{P}(X>45)=\mathrm{P}\left(Z>\dfrac{45-42}{5}\right)=\mathrm{P}(Z>0.6)$	M1
	$=1-0.7257$ or 0.2743 allow $1-$ awrt 0.726 or awrt 0.274	A1
	$\mathrm{P}(X>45 \text{ on 3rd throw} \mid \text{in final})=\dfrac{"0.3446"^2\times"0.2743"}{"0.959"}$	dM1
	$=\dfrac{"0.0326..."}{"0.9590..."}$ (calc: 0.033952…)	
	= awrt **0.034**	A1
		(5)
		Total 8

	Notes
(a)	1st M1 for standardising with 40, 42 and 5. Allow $\pm\dfrac{40-42}{5}$
	2nd M1 for $1-p$ (where $p>0.5$)
	A1 awrt 0.345 (NB Calc gives 0.3445783…)
(b)	1st M1 for identifying all the cases to qualify with correct ft probabilities
	2nd M1 for an attempt standardise with 45, 42 and 5 ie $\pm\dfrac{45-42}{5}$
SC B1	**Use $\mu=40$** Using $\mu=40$ to find P($X>45$) will give 0.1587 and can award B1 if we see this used in an expression of the form $("0.3446")^2\times0.1587$. Score on epen as 2nd M0 1st A1
	They may also be able to score 1st M1 and 3rd M1 as well
	1st A1 for 1 – awrt 0.726 or awrt 0.274 (sight of either of these scores 2nd M1 and 1st A1)
	May be part of an expression such as $("0.3446")^2\times0.2743$
	3rd dM1 **dep on 1st M1** for $\dfrac{("\text{their } 0.3446")^2\times"\text{their } 0.2743"}{\text{their } q}$
	providing the numerator < denominator and num and denom are both probs
	2nd A1 for awrt 0.034 (NB numerator is awrt 0.033 so must be awrt 0.034)