Q	Marking Instructions	AO	Mark	Typical Solution
17(a)	Obtains either z-value from inverse normal distribution **Condone sign error** **AWFW** [−1.29, −1.28] or [−0.85, −0.84]	3.1b	B1	$P\left(Z < \dfrac{30 - \mu}{\sigma}\right) = 0.1$ $P\left(Z > \dfrac{32.5 - \mu}{\sigma}\right) = 0.8$
	Forms one equation with unknown μ and σ using standardised result and z-value (for 0.1) Accept $z = (-4, 4)$ except ±0.1, ±0.2, ±0.8, ±0.9 **Condone** $\mu - 30$ **Must use 30**	1.1a	M1	$z = -1.2816 \quad z = -0.8416$ $\dfrac{30 - \mu}{\sigma} = -1.2816$
	Forms next equation with unknown μ and σ using standardised result and z-value (for 0.8) Accept $z = (-4, 4)$ except ±0.1, ±0.2, ±0.8, ±0.9 **Condone** $\mu - 32.5$ **Must use 32.5**	1.1a	M1	$\dfrac{32.5 - \mu}{\sigma} = -0.8416$ $2.5 = 0.44\sigma$ $\sigma = 5.68$ $\mu = 37.3$
	Obtains both equations **correctly**	1.1b	A1	
	Solves their two simultaneous equations in the form of μ and σ	1.1a	M1	
	Obtains correct value of σ **AWFW** (5.2, 5.9) **ISW**	1.1b	A1	
	Obtains correct value of μ **AWFW** (37.1, 37.5) **ISW**	1.1b	A1	
17 (b)(i)	States correct probability	1.2	B1	1
17 (b)(ii)	Uses their μ and their σ to find $P(X < 35)$ **PI** by correct value of probability using their μ and their σ or correctly calculated z-value using their μ and their σ	1.1a	M1	$P(X < 35) = 0.344$
	Obtains correct probability to 2 decimal places or better **FT** their μ and their σ If μ = (37.1, 37.5) and σ = (5.2, 5.9) used, answer will be (0.31, 0.37)	1.1b	A1F	
17(c)	Identifies the Binomial distribution model with $n = 13$, $p =$ their 0.344 **PI** by correct value of probability using their p	3.1b	M1	Y= no. of brownies less than 35g in a batch of 13
	Obtains correct probability to 2 decimal places or better **FT** their p If $p = (0.31, 0.37)$ answer will be [0.23, 0.39]	1.1b	A1F	$Y \sim B(13, 0.344)$ $P(Y \le 3) = 0.294$
	Total		12	