Question Number	Scheme	Marks
3 (a)	$\bar{x} = \left[\dfrac{509.1572 + 510.8428}{2} =\right] 510$	B1
	$2 \times 1.96 \times \dfrac{\sigma}{\sqrt{n}} = 510.8428 - 509.1572$	M1
	$\dfrac{\sigma}{\sqrt{n}} = 0.43$	A1
	$'510' \pm 1.6449 \times '0.43'$	M1 B1
	$(509.292..., 510.707...)$ (awrt 509.3, awrt 510.7)	A1
		(6)
(b)	Let X = The number of confidence intervals containing μ so $X \sim B(3, 0.9)$	
	$P(X \geqslant 1) = 1 - P(X = 0) = 1 - \left[{}^3C_0 \times 0.9^0\right] \times 0.1^3$	M1
	$= 0.999$	A1
		(2)
	Notes	**Total 8**
(a)	**B1** for $\bar{x} = 510$	
	M1 for use of $2 \times z$ value $\times \dfrac{\sigma}{\sqrt{n}} = 510.8428 - 509.1572$ oe	
	A1 Cao	
	M1 for use of $\bar{x} \pm z$ value $\times \dfrac{\sigma}{\sqrt{n}}$ ft their $\bar{x}$ and their $\dfrac{\sigma}{\sqrt{n}}$	
	B1 $z = 1.96$ or better and $z = 1.6449$ or better	
	A1 (awrt 509.3, awrt 510.7)	
(b)	**M1** for writing or using $P(X \geqslant 1) = 1 - P(X = 0)$ or $P(X = 1) + P(X = 2) + P(X = 3)$	
	A1 Cao	