

Q1

- a) I expect 19 samples cover the true range μ .
- b) The probability my first interval covers μ is 0.95.
- c) The probability at least 19 intervals contain μ is 0.736.

consider where the calculated interval contains
sample to be a binomial probability distribution
with $p = 0.95$

$$X \sim \text{Bin}(20, 0.95)$$

$$\begin{aligned} P(19 \leq X) &= \sum_{i=19}^{20} b(i; 20, 0.95) = \sum_{i=19}^{20} b(i; 20, 0.95) \\ &= \binom{20}{19} 0.95^{19} (1 - 0.95)^{20-19} + \binom{20}{20} 0.95^{20} (1 - 0.95)^{20-20} \\ &= 20 \cdot 0.95^{19} (0.05) + 20^{20} = 0.736 \end{aligned}$$

d) 1