2.)

(a.) Since w/ replacement, $\left(\dfrac{n-1}{n}\right)$ is prob that it is $\underline{\underline{not}}$
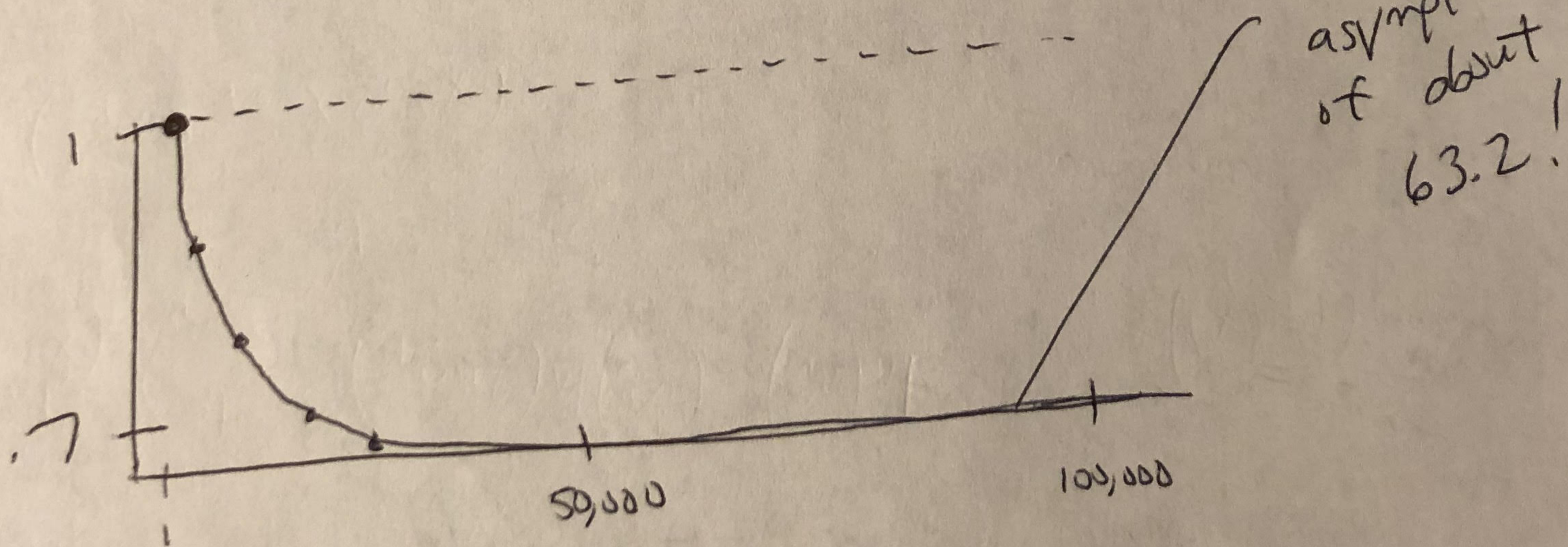
(b) $\dfrac{n-1}{n}$, since doing this w/ replacement.

(c) $(1-\tfrac{1}{n})$ is prob that j^{th} obs not selected, since independent random sampling done w/ replacement n times, joint prob =

$\prod$ marginal probs $= (1-\tfrac{1}{n})^n$

(d) $1 - P(\text{not in sample}) = 1 - \left(\tfrac{4}{5}\right)^5 = 1 - \dfrac{4^5}{5^5} = 0.67232$

(e)

$$1 - \left(\tfrac{99}{100}\right)^{100} = \cancel{} .63397$$

(f) $1 - \left(\dfrac{9,999}{10,000}\right)^{10,000} \approx \cancel{100} \; 63.2\%$

(g)

reaches an asymptote of about 63.2!

(h) Numerical result $= .6409$, close to analytical result of $.63397$ derived above, which makes sense. If we would do this n times instead of $10k$, would approach analytical result.