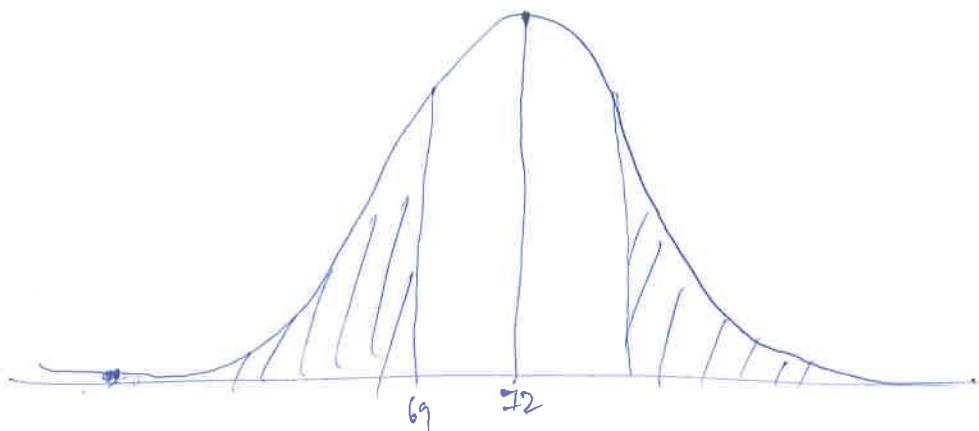


Q1)

- a) Population mean = 72 bpm
Sample mean = 69 bpm
- b) H_0 : The new relaxation app does not reduce the average resting rate of regular users.
 H_1 : The new relaxation app reduces the average resting rate of regular users.
- c) $\frac{\bar{x} - \mu}{\sqrt{n}} \Rightarrow \frac{69 - 72}{\sqrt{64}} \Rightarrow \frac{-3}{8} = \text{standard error}$.
 ⇒ The no. of errors from the baseline to the mean.
- d) $z\text{-score} = \frac{\sigma}{se} \Rightarrow \frac{3}{-3/8} \Rightarrow \frac{24}{3} \Rightarrow -8$

e)



Q2)

a) $P(B|A) \cdot P(A)$

= 20%

b) $P(A|B)$

If the message is not spam, the filter still marks it as "spam" with probability 0.05.

c) $P(B) = P(B|A) \cdot P(A) + P(B|\neg A) \cdot P(\neg A)$

$$= 0.95 \times 0.2 + 0.05 \times 0.1$$

or

d) Posterior probability is higher.