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Q.1

a) population mean = 72 bpm

sample mean = 69 bpm

b) $H_0 \rightarrow \mu \leq 69$ bpm

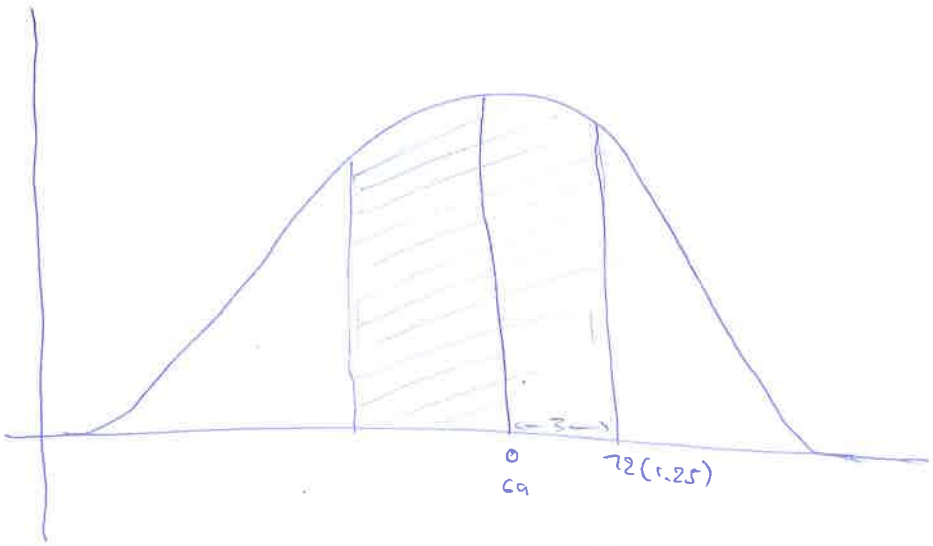
$H_1 \rightarrow \mu > 69$ bpm

c) Distance interms of standard errors

$$S.E = \frac{\sigma}{\sqrt{n}} = \frac{10}{\sqrt{64}} = \frac{10}{8} = 1.25$$

d) $$Z\text{-score} = \frac{72 - 69}{1.25} = \frac{3}{1.25} = 2.4$$

e)



Q.2

a) P(S) = 20% = 0.2

probability of all incoming messages are spam P(A) (prior).

b) P(A/B) is the posterior, posterior is the updated probability after getting evidence.

c) $P(B/A)P(A) + P(B/A^c)P(A^c)$

$(0.9)(0.1) + (0.05)(0.95) = 0.13$

d) The posterior probability will be high, because it is the updated probability after getting evidence, it will be finalized.