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Q1 a) Population mean = 72 bpm
Sample mean = 69 bpm

b) H_1: A bpm < N bpm
H_0: A bpm ≥ N bpm

∴ A = regular app users
N = regular users (don't use app)

c) Standard error = $\frac{\text{standard deviation}}{\sqrt{n}}$

∴ n = no. of sample

$= \frac{10}{\sqrt{64}}$

$= \frac{10}{8} \frac{5}{4}$ 1.25

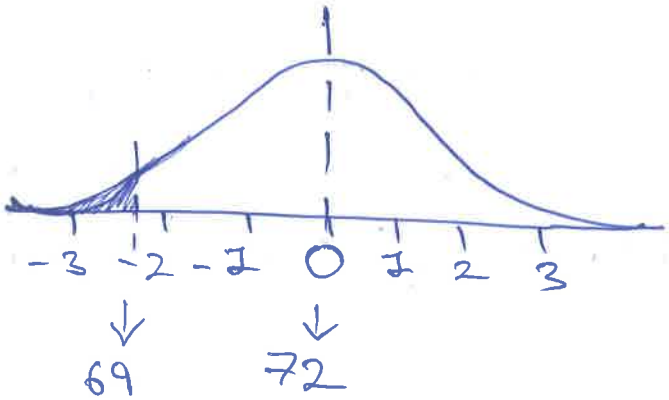
standard error = 1.25

⇒ standard error is the standard deviation of the sample.

d) Z score = $\frac{x - \mu}{S.E} = \frac{69 - 72}{1.25} = \frac{-3}{1.25}$

Z score = −2.4

e)



Q2 a) prior probability in eq above = P(A)

value of prior probability in example = 0.2 or 20%

b) posterior probability = P(A|B)

⇒ posterior probability is the probability after we update the prior probability using evidence factor.

there in example posterior probability will be the probability that message is sham given the evidence that it was marked as sham.

c) $P(B) = P(B|A)P(A) + P(B|A^c)P(A^c)$

∴ P(B) = total Probability,

values we will use:

P(B) → marked as sham

P(A) → sham message

P(A^c) → not sham

$P(B|A) = 0.9$

$P(B|A^c) = 0.05$

$P(A) = 0.2$

$P(A^c) = 0.8$

d) In the above example the posterior probability will be lower than prior as the evidence factor is less than 1.