

Melvin

21) a) Population mean is 72 bpm and the Sample mean is, 64, 64 regular users of the app.

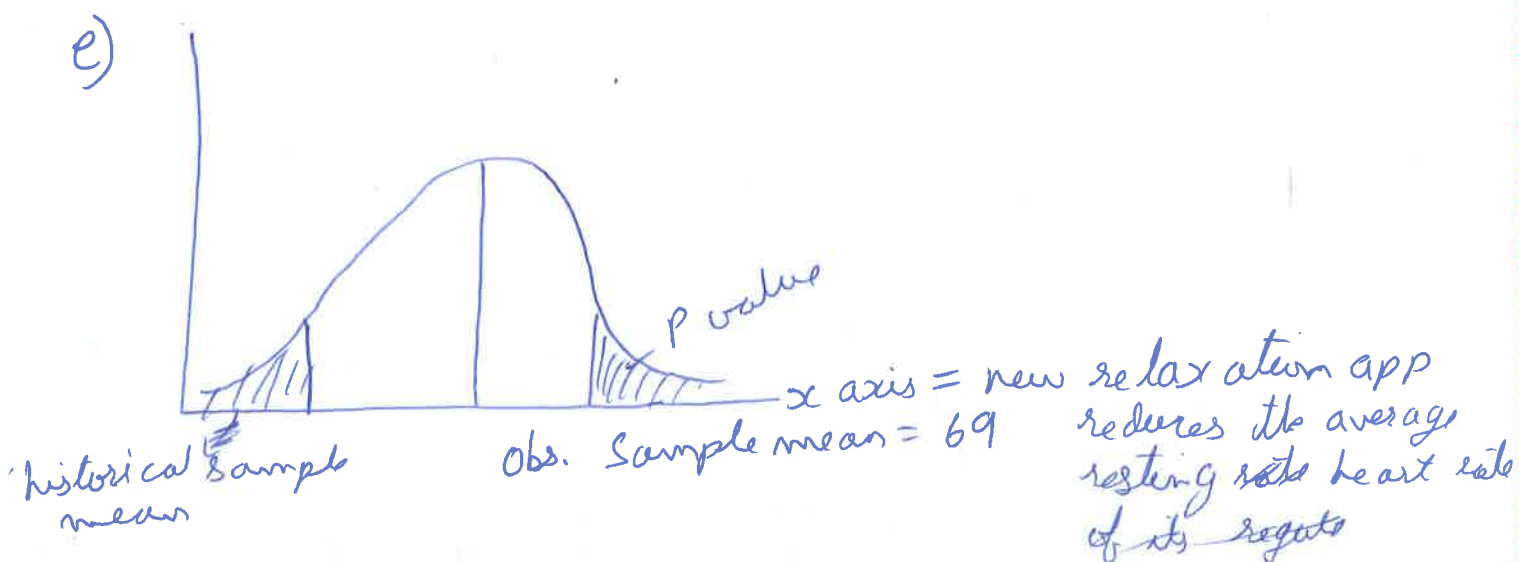
b) null Hypothesis ( $H_0$ ):- New relaxation app does not reduce the average resting heart rate of its regular users.

Alternative Hypothesis ( $H_1$ ):- New relaxation app reduces the average resting heart rate of its regular users.

c) Standard error is  $\frac{10}{\sqrt{64}}$

Standard error is the standard deviation mean.

d) ~~D~~  $Z = \frac{x - \mu}{SE} = \frac{69 - 72}{\frac{10}{\sqrt{64}}} = -\frac{3}{\frac{10}{\sqrt{64}}}$



$$Q2) P(A|B) = P(A) \times \frac{P(B|A)}{P(B)}$$

$$P(B) = P(B|A)P(A) + P(B|A')P(A')$$

$$P(A) = 20\% = 0.2 \quad P(A') = 80\% = 0.8$$

$$P(B|A) = 0.9 \quad P(B|A') = 0.05$$

a) Prior probability is 0.2 ~~or 20%~~ and  $P(A)$  is the prior probability.

b) Posterior probability is  $P(A|B)$ . Posterior probability, the final updated evidence of the probability or it is the probability of spam given marked as spam.

$$c) P(A|B) = P(A) \times \frac{P(B|A)}{P(B)}$$

$$= 0.2 \times \frac{0.9}{0.22} = 0.2 \times \frac{0.9}{0.22}$$

$$P(B) = 0.9 \times 0.2 + 0.05 \times 0.8$$

$$P(B) = 0.18 + 0.04 = 0.22$$

d) ~~Yes~~ NO, the posterior probability will not be higher than the prior. it will be lower than the prior. The posterior will be ~~lower~~ <sup>higher</sup> than prior. Because prior is ~~high~~ <sup>higher</sup> while we update the probability by the evidence.

d) The posterior probability will be higher than prior, as we update the initial probability with evidence.