

Q.3

a. mean and variance of the sampling distribution for the sample mean

$$\mu_{\bar{x}} = \mu = 200$$

$$\sigma_{\bar{x}}^2 = \sigma^2/n = 625/25 = 25 \quad \sigma_{\bar{x}} = \sqrt{\sigma_{\bar{x}}^2} = \sqrt{25}$$

b. Probability that $\bar{x} > 209$ $z_{\bar{x}} = \frac{209-200}{\sqrt{25}} = 1.80$ $1 - Fz(1.80) = .0359$

c. Probability that $198 \leq \bar{x} \leq 211$ $z_{\bar{x}} = \frac{198-200}{\sqrt{25}} = -.40$ $1 - Fz(.40) =$
.3446

$$z_{\bar{x}} = \frac{211-200}{\sqrt{25}} = 2.20 \quad Fz(2.20) = .9861. \quad .9861 - .3446 = .6415$$

d. Probability that $\bar{x} \leq 202$ $z_{\bar{x}} = \frac{202-200}{\sqrt{25}} = .40$ $Fz = .6554$

Q.4

a. $\sigma_{\hat{p}} = \sqrt{\frac{(.3)(.7)}{200}} = .0324$

b. $P(Z < \frac{.25-.3}{.0324}) = P(Z < -1.54) = .0618$

c. $P(Z > \frac{.33-.3}{.0324}) = P(Z > .93) = .1762$

d. $P(\frac{.27-.3}{.0324} < Z < \frac{.33-.3}{.0324}) = P(-.93 < Z < .93) = .6476$