1 MATH 107/CCE

Spring 2004
University of Rhode Island
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Quiz 4-Solutions

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1. $S \sim N(520, 85)$

(a)

$$P(S > 620) = P(\frac{S-520}{85} > \frac{620-520}{85}) = P(Z > 1.18)$$
$$= 0.5 - P(0 < Z < 1.18) = 0.5 - 0.3810 = 0.119 = 11.9\%$$

(b)

$$P(400 < S < 670) = P(\frac{400-520}{85} < \frac{S-520}{85} < \frac{670-520}{85}) = P(-1.41 < Z < 1.76)$$
$$= P(0 < Z < 1.41) + P(0 < Z < 1.76) = 0.4202 + 0.4608 = 0.881 = 88.1\%$$

(c)

$0.15 = P(S > S^\star) = P(\frac{S-520}{85} > \frac{S^\star-520}{85}) = P(Z > Z^\star) \Longrightarrow P(0 < Z < Z^\star) = 0.35$

Table for normal distribution gives: $Z^\star = 1.04$.

Thus $\frac{S^\star-520}{85} = 1.04 \Longrightarrow S^\star = 520 + 1.04 \cdot 85 = 611.8$

2.

Margin of error=MOE

(a)

$MOE = \dfrac{z_{0.48}}{2\sqrt{625}} = \frac{2.05}{50} = 0.041 \approx 4\%$

Confidence interval CI: $(57 - 4, 57 + 4) = (53, 61)$.

(b)

$MOE = \dfrac{z_{0.49}}{2\sqrt{625}} = \frac{2.33}{50} = 0.0466 \approx 4.7\%$

Confidence interval CI: $(57 - 4.7, 57 + 4.7) = (52.3, 61.7)$.

(c)

$n = \left(\dfrac{z_{0.45}}{2 \cdot MOE}\right)^2 = \left(\dfrac{1.645}{2 \cdot 0.03}\right)^2 27.416^2 = 751.67 \approx 752.$