

WS: More Practice: CLT + Conf Int

①  $\bar{x} = 125$   $p = 30$   $CL = .95$   $n = 150$   $df = 149$

$$125 \pm 1.984 \left( \frac{30}{\sqrt{150}} \right)$$

$$t_{.95}^*(100) = 1.984$$

$$125 \pm 1.984(2.45) = 125 \pm 4.86$$

$$(120.14, 129.86)$$

②  $n = 100$   $\hat{p} = \frac{35}{100} = .35$   $\hat{q} = .65$   $CL = .98$   $z^* = 2.326$

$$.35 \pm 2.326 \left( \sqrt{\frac{(.35)(.65)}{100}} \right) = .35 \pm 2.326(.048)$$

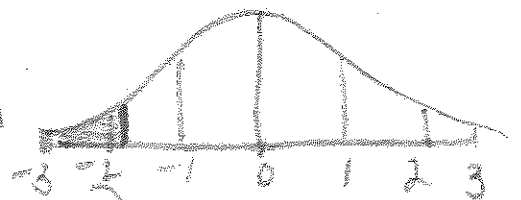
$$= .35 \pm .1109$$

$$(.2391, .461)$$

③  $\mu = 50,000$   $\sigma = 800$

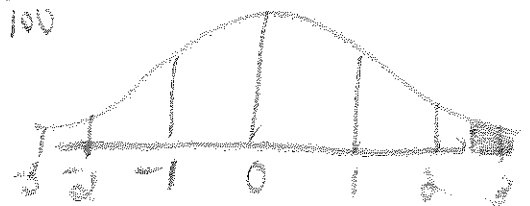
a)  $P(X < 48,500) = P\left(z < \frac{48,500 - 50,000}{800}\right)$

$n=1$   $= P(z < -1.875) = .0304$



$n=100$  b)  $P(X > 50,200) = P\left(z > \frac{50,200 - 50,000}{\frac{800}{\sqrt{100}}}\right)$

$$= P(z > 2.5) = .0062$$



$$\textcircled{4} \quad n=60 \quad \hat{p} = \frac{5}{60} = \frac{1}{12} \quad \hat{q} = \frac{11}{12} \quad CL = .95 \quad z^* = 1.96$$

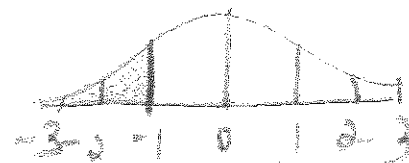
$$.0833 \pm 1.96 \left( \sqrt{\frac{(.0833)(.9167)}{60}} \right)$$

$$= .0833 \pm 1.96 (.0357) = .0833 \pm .0699$$

$$\boxed{(.0134, .1532)}$$

$$\textcircled{5} \quad \mu = 303 \quad \sigma = 3$$

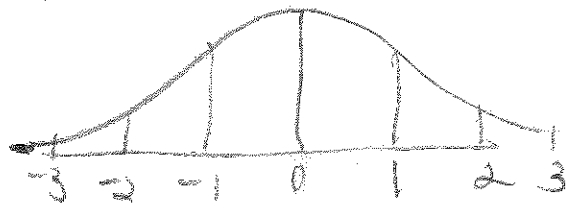
$$n=1 \quad \text{a) } P(X < 300) = P\left(z < \frac{300 - 303}{3}\right) = P(z < -1) = .159$$



$$\text{b) } n=10 \quad \bar{X} = 303 \quad (\text{remember: } \bar{X} \text{ is an estimator of } \mu)$$

$$SE = \frac{3}{\sqrt{10}} = .9487$$

$$n=10 \quad \text{c) } P(X < 300) = P\left(z < \frac{300 - 303}{\frac{3}{\sqrt{10}}}\right) = P(z < -3.16)$$



$$= .00079 = .079\%$$

really small  
prob of that occurring.