Name: Key Hour: ____ Date: ____

4-step practice questions

1. Suppose we are interested in finding out the proportion of the population at HFII HS that has seen The Office. We contact an SRS of 100 students in the school. Of these 100 students, 63 report seeing The Office. Find a 95% confidence interval for the true proportion of HFII HS students who have seen The Office. $\hat{p} = 63/100 = .63$ $1-\hat{p} = 37/100 = .37$

State: We want to estimate the true proportion p of all HFII HS students who have seen the Office at a 95% confidence level.

Plan: One Sample z interval for p

① Random: SRS of 100 students ✓

② 10% (Independent)
$10(100) < 1000$ ✓ pop of all HFII HS students
Reasonable to assume ✓

③ Normal:
$63 \geq 10$ ✓ # of successes $(.63 \times 100)$
$37 \geq 10$ ✓ # of failures $(.37 \times 100)$

Do: P.E. $\pm$ M.E. $\rightarrow \hat{p} \pm z^* \sqrt{\frac{\hat{p}(1-\hat{p})}{n}} = .63 \pm 1.96 \sqrt{\frac{.63(.37)}{100}}$

$z^*_{95\%} = 1.96$

$= .63 \pm .095 \rightarrow (.535, .725)$

Conclude: We are 95% confident that the interval from .535 to .725 captures the true proportion of HFII students who have seen the Office

Name: _____ Hour: _____ Date: _____

2. Mr. G has done over 50 track days at Gingerman Raceway in South Haven Michigan. He keeps track of each lap time (in seconds) and has found that they follow an approximately normal distribution. A random sample of 9 laps shows a mean laptime of $\bar{x} = 102.4$ seconds with a standard deviation of $s_x = 3.2$ seconds. Create a 90% confidence interval for Mr. G's career average lap time.

State: We will estimate μ the true mean career lap time in seconds for Mr. G at a 90% confidence level.

Plan: One-Sample t interval for μ

① Random: Random Sample of 9 laps ✓

② 10% (Independent) to (a) ∠ pop of all laps Mr. G has done Reasonable to Assume ✓

③ Normal: Stated "Approx. Normal Distribution" ✓

Do: P.E. ± M.E. → $\bar{x} \pm t^* \frac{s_x}{\sqrt{n}}$ $t^*_{90\%}$ → $df = 8$ → InvT(.05, 8) → $t^* = 1.860$

→ $102.4 \pm 1.860\left(\frac{3.2}{\sqrt{9}}\right)$

→ 102.4 ± 1.984 → (100.416, 104.384)

Conclude: We are 90% confident that the interval from 100.416 to 104.384 seconds captures the true mean μ career lap time.