1.

$\boxed{\text{State:}}$ We will estimate p → true proportion of EKHS students who have seen The Office at a 95% confidence level.

$\boxed{\text{Plan:}}$ One sample z interval for p

Random: "SRS"

10%: $100 < \frac{1}{10}$ all EKHS students

Normal: Large counts
$100 \times .63 = 63$
$100 \times .37 = 37$ ≥ 10 ✓

$\boxed{\text{Do:}}$ Point Estimate ± Margin of Error

$$\hat{p} \pm z^* \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$$

$$.63 \pm 1.96\sqrt{\frac{.63 \times .37}{100}}$$

$$= .63 \pm .095 \rightarrow .535 \text{ to } .725$$

$\boxed{\text{Conclude:}}$ We are 95% confident that the interval from .535 to .725 captures the true proportion of EKHS students who have seen the office.

②

$\boxed{\text{State:}}$ We will estimate $\mu \rightarrow$ true mean career lap time at a 90% confidence level.

$\boxed{\text{Plan:}}$ One sample t interval for μ

Random: ~~[illegible]~~ "Random sample of 9"

10%: $9 < \frac{1}{10}$ all laps

Normal: "Approx. Normal distribution."

$\boxed{\text{Do:}}$ General: Point Estimate ± margin of error

$$\bar{x} \pm t^* \frac{S_x}{\sqrt{n}}$$

$$102.4 \pm 1.860 \times \frac{3.2}{\sqrt{9}}$$

$$= 102.4 \pm 1.984 \rightarrow 100.416, 104.384$$

$\boxed{\text{Conclude:}}$ We are 90% confident that the interval from 100.416 to 104.384 seconds captures the true mean career lap time.

3.

$\boxed{\text{State:}}$ We will estimate p → true proportion of made free throws at a 99% confidence level.

$\boxed{\text{Plan:}}$ One sample z-interval for p

Random:
"random sample"
Assumed ✓

10%
$50 < \frac{1}{10}$ all free throws

Normal: Large Counts
$50 \times .62 = 31$
$50 \times .38 = 19$
≥ 10 ✓

$\boxed{\text{Do:}}$ Point Estimate ± margin of error

$$\hat{p} \pm z^* \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$$

$$.62 \pm 2.576 \sqrt{\frac{.62 \times .38}{50}}$$

$$= .62 \pm .179 \rightarrow (.443, .797)$$

$\boxed{\text{Conclude:}}$ We are 99% confident that the true proportion of made free throws is captured by the interval from .443 to .797.