SET UP.

$X_i \overset{iid}{\sim} \text{Poisson}(\lambda) \quad i = 1, 2, \dots, 10$

From the data, we compute $\hat{\lambda} = \bar{X}_{11} =$ **8.2**

$\text{Var}(\hat{\lambda}) = \text{Var}(\bar{X}_{11}) =$ ________ using the plugin principle $\widehat{\text{Var}}(\bar{X}_{10}) =$ ________

$\Rightarrow \quad \widehat{sd}(\bar{X}_{10}) =$ ______

CHALLENGE Find a 95% confidence interval for λ

1. Identify the sampling distribution:

   By the CLT, $Z =$ ________ $\dot{\sim}$ ________

2. Form interval for that distribution:

   $P(a < Z < b) = 0.95$

   But Z is symmetric so

   $P(\_ < Z < \_) = 0.95$

   $\Rightarrow P(Z > a) =$ ________ $=$ ________

   $\Rightarrow \quad a = 1.96$ from normal table.

   $\Rightarrow P($____ $< Z <$ ____$) = 0.95$

3. Back transform

   $$P\left(-1.96 < \frac{\bar{X}_n - E(\bar{X}_n)}{\widehat{sd}(\bar{X}_n)} < 1.96\right)$$

$= P(\_\_\_\_\_\_\_\_ < \lambda < \_\_\_\_\_\_\_\_)$

4. Write as an interval:

$\mu \in (\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_)$

5. Plug in estimates.

$\mu \in (\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_)$

$\Rightarrow \mu \in (\_\_\_\_, \_\_\_\_)$