Stat 171 - Worksheet for Section 6.3

Name: _____

1. In a survey of 2462 U.S. teachers, 123 said that "all or almost all" of the information they find using search engines online is accurate or trustworthy.
   (a) Identify x and n.
   (b) Use x and n to find $\hat{p} = \dfrac{x}{n}$.

2. Use the data in Problem 1 to construct a 90% confidence interval for the population proportion of U.S. teachers who say that "all or almost all" of the information they find using search engines online is accurate or trustworthy.
   (a) Find $\hat{p} = \frac{x}{n}$ and $\hat{q} = 1 - \hat{p}$.
   (b) Verify that the sampling distribution of $\hat{p}$ can be approximated by a normal distribution.
   (c) Find z_c from table 4 and $E = z_c\sqrt{\dfrac{\hat{p}\hat{q}}{n}}$.
   (d) Use $\hat{p}$ and E to find the left and right endpoints of the confidence interval.
   (e) Interpret the results.

3. The table below is from a survey of 498 U.S. adults. Construct a 99% confidence interval for the population proportion of U.S. adults who think that people over 65 are the more dangerous drivers.

Teenagers	71%
People over 65	25%
No opinion	4%

Who are the most dangerous drivers

4. A researcher is estimating the population proportion of U.S. adults ages 18 to 24 who have had an HIV test. The estimate must be accurate within 2% of the population proportion with 90% confidence. Find the minimum sample size needed when (1) no preliminary estimate is available and (2) a previous survey found 31% of U.S. adults ages 18 to 24 had an HIV test.

   (a) Identify $\hat{p}, \hat{q}, z_c$, and E. If $\hat{p}$ is unknown, use 0.5.

   (b) Use $\hat{p}, \hat{q}, z_c$ to find the minimum sample size $n = \hat{p}\hat{q}\left(\frac{z_c}{E}\right)^2$.

   (c) Interpret the results.