Name: _____

MAT 121
Summer 2019
Homework 10

"When you look at someone through rose-colored glasses, all the red flags just look like flags."
— Wanda Pierce, BoJack Horseman

Problem 1: According to the Onondaga County Medical Examiner's Office,[1] there were 101 opioid related deaths in the county in 2018. Using the estimate population of Onondaga Country and the estimate number of deaths in the county,[2] we estimate there are 2,913 deaths in Onondaga county.

(a) Using the data above, construct a 95% confidence interval for the proportion of deaths in Onondaga Country caused by opioids. State your conclusions in the context of the problem.

(b) How many cause of deaths would have to be surveyed to estimate the proportion of deaths in Onondaga Country caused by opioids within 0.1%, assuming you are constructing a 95% confidence interval.

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[1]https://healthystories.ongov.net/onondaga-county-opioid-epidemic-data-report/
[2]See http://www.ongov.net/about/ and https://www.kff.org/other/state-indicator/death-rate-per-100000/

Problem 2: You want to estimate parameters (mean and standard deviation) for the distribution of GPAs of Syracuse University students. You survey 12 students and find the following GPAs:

$$3.54 \quad 3.59 \quad 3.10 \quad 2.89 \quad 3.57 \quad 2.99 \quad 3.48 \quad 3.65 \quad 3.71 \quad 4.00 \quad 3.78 \quad 3.42$$

(a) Find the sample mean and sample standard deviation. [You need not show your work.]

(b) Construct a 99% confidence interval for the population mean μ. State your conclusions in the context of the problem.

(c) Construct a 99% confidence interval for the population standard deviation σ.