Name: _____

MATH 108
Fall 2023
HW 12: Due 11/06

"I know of scarcely anything so apt to impress the imagination as the wonderful form of cosmic order expressed by the [Central Limit Theorem]. The law would have been personified by the Greeks and deified, if they had known of it."

– Sir Francis Galton

Problem 1. (10pt) Your engineering firm has been hired to do quality control analysis for a chip manufacturer. The company requests you analyze their rate of defective chips to minimize any potential harms to their brand. After testing 38 chips, you determine that approximately 4.6% of the chips have some type of minor defect. Suppose that the standard deviation of the production rate of the chips is known to be $\sigma = 0.012$.

(a) Assuming that the average defect rate in the chips is 4.6%, find the probability that a same of 38 chips contains a defect percentage of less than 4%.

(b) Assuming that the average defect rate in the chips is 4.6%, find the probability that a same of 38 chips contains a defect percentage of more than 4.5%.

(c) Construct a 97% confidence interval for the true average defect rate in the chips.