1: If you know a population's standard deviation is 4.5, how large of a sample size is needed for the margin of error to be 0.5 when making a 95% confidence interval?

2: The following ten numbers were drawn from a normal distribution:

$$6.61 \quad 7.78 \quad 7.73 \quad 7.5 \quad 7.5 \quad 8.42 \quad 7.73 \quad 8.19 \quad 7.54 \quad 7.08$$

Those ten numbers have a mean of 7.608 and a sample standard deviation of 0.512. Find a 90% confidence interval for the population mean.

3: With a signficance level of 0.02, test whether these two samples came from populations with equal means.

Sample 1
0.086   0.103   0.101   0.13   0.121   0.108

Sample 2
0.187   0.172   0.122   0.168

4: Ten students' scores on two exams are shown below. Determine a 95% confidence interval of the mean difference.

student	01	02	03	04	05	06	07	08	09	10
exam 1	84.4	68	76.2	84.4	84.6	88.4	78.6	93.8	53.6	76.3
exam 2	87.1	71	84.3	95.9	91.9	96.5	88.8	91.4	65.3	79.7

5:   Let X and Y represent two populations.

$$X \sim \mathcal{N}(45,\ 7)$$

$$Y \sim \mathcal{N}(50,\ 9)$$

Let W represent a sampling distribution when drawing 5 from each population and finding the difference of means.

$$W = \frac{Y + Y + Y + Y + Y}{5} - \frac{X + X + X + X + X}{5}$$

The central limit theorem tells us W is normally distributed. Determine the mean and standard deviation of W.