Sample Proportion Sampling Dist: $\mu_{\hat{p}} = p$ and $\sigma_p = \sqrt{\frac{p(1-p)}{n}}$

Sample Proportion Sampling Dist z-score: $Z = \frac{\hat{p}-\mu_p}{\sigma_p} = \frac{\hat{p}-p}{\sqrt{\frac{p(1-p)}{n}}}$

Sample Mean Sampling Distribution: $\mu_x = \mu_{\bar{x}}$ and $\sigma_{\bar{x}} = \frac{\sigma_x}{\sqrt{n}}$

Sample Mean Sampling Dist z-score: $Z = \frac{\bar{x}-\mu_{\bar{x}}}{\sigma_{\bar{x}}} = \frac{\bar{x}-\mu_x}{\frac{\sigma_x}{\sqrt{n}}}$

1) The mean of all possible sample means of size n equals the _____ of the population.

2) The standard deviation of all possible sample means of size n equals the population standard deviation divided by _____. (What goes in the brackets below?)

$$\sigma_{\bar{x}} = \frac{\sigma_x}{[\quad]}$$

3) The mean of all possible sample proportions of size n equals the population

_____.

4) The standard deviation of all possible sample proportions of size n equals the population proportion times one minus the population proportion divided _____. (What goes in the brackets below?)

$$\sigma_{\hat{p}} = \sqrt{\frac{p*(1-p)}{[\quad]}}$$

5) The central limit theorem tells us that the distribution of the sample mean approximately follows which distribution when the sample size is large?

6) The population mean annual salary for a Red Sox player is $6 million dollars with a standard deviation of $1.5 million dollars.

   a. What is the mean of the sampling distribution of the sample mean salary for n = 35 Red Sox players?

   b. What is the standard error of the sampling distribution of the sample mean where n= 35?

   c. Find the probability that the sample mean salary for n = 35 Red Sox Players is less than $5 million. Give answer to 4 decimal places and write out a sentence about what it means.

   d. Find the probability that the sample mean salary for n = 3 Red Sox Players is less than $5 million. Give answer to 4 decimal places and write out a sentence about what it means. It is okay to assume salaries are normally distributed to answer this question.

7) The population proportion of home games won by the Red Sox is .56.

   a. What is the mean of the sampling distribution of the sample proportion of games won by the Red Sox for $n = 81$ games?

   b. What is the standard error of the sampling distribution of the sample proportion where $n = 81$?

   c. Find the probability that the sample proportion of games won for $n = 81$ games is less than .5. Give answer to 4 decimal places and write out a sentence about what it means.

   d. Find the probability that the sample proportion of games won for $n = 40$ games is less than .5. Give answer to 4 decimal places and write out a sentence about what it means.

8) The population mean self-attractiveness rating for our class was 6.95 with a standard deviation of 1.72. It is safe to assume self-attractiveness ratings are normally distributed. Complete parts a through c.

    a.   What is the mean of the sampling distribution of the sample mean self-attractiveness rating for $n = 3$ students?

    b.   What is the standard error of the sampling distribution of the sample mean self-attractiveness rating where $n = 3$ students?

    c.   Find the probability that the sample mean self-attractiveness rating for $n = 3$ students is less than 5. Give answer to 4 decimal places and write out a sentence about what it means.

    d.   Find the probability that a randomly selected person has a self-attractiveness rating less than 5. Give answer to 4 decimal places and write out a sentence about what it means.

9) The population proportion of students that rated themselves higher than the rest of the class is 0.61. Complete parts a and b.

   a. What is the mean of the sampling distribution of the sample proportion of students that rated themselves higher than the rest of the class for $n = 4$ students?

   b. What is the standard error of the sampling distribution of the sample proportion of students that rated themselves higher than the rest of the class for $n = 4$ students?

   c. Find the probability that most of the sample proportion of students rated themselves higher than the rest of the class for n = 4 students. Give answer to 4 decimal places and write out a sentence about what it means.

   d. Find the probability that most of the sample proportion of students rated themselves higher than the rest of the class for n = 8 students. Give answer to 4 decimal places and write out a sentence about what it means.