**Activity 7.3.2 – The Role of Sample Size**

In **Activity 7.3.1** we saw how sample proportions from random samples vary. Some sample proportions are very close to the population proportion; others are far away. We also saw that the standard error of sample proportions depends on the sample size. This activity provides you an opportunity to use technology to gain greater insight on this concept.

**Constitutionality of Same-Sex Marriage**

A May 2015 Gallop poll reported that 60% of adults in the United States support same-sex marriage. Let’s assume that 0.60 is the population proportion of all adults in the United Sates that support same-sex marriage. Using Statkey we can examine simulated distributions of sample proportions for a variety of sample sizes.

**Exploring Distributions of Sample Proportions in Statkey**

Directions:

|  |  |  |
| --- | --- | --- |
| Sample Size, *n* | Mean | Standard Error  |
| 10 |  |  |
| 20 |  |  |
| 50 |  |  |
| 80 |  |  |
| 100 |  |  |

* Go to <http://lock5stat.com/statkey/index.html>
* Click on **Proportions** in the Sampling Distributions section
* Click **Edit Proportion** to set the population proportion to *p* = 0.60
* Set **Samples of size *n*** to 10
* Click **Generate 1000 Samples**
* The simulation will show 1000 sample proportions. In the upper right corner, you will see the mean and standard deviation of the simulated sample proportions.
1. Complete the table below. For each sample size, record the mean and standard error (standard deviation) of 1000 simulated sample proportions.
2. What happens to the mean of the distribution of sample proportions as the sample size increases?
3. What happens to the standard error of the distribution of sample proportions as the sample size increases?
4. Create a graph of the standard error as a function of sample size. Label and scale the axes appropriately.



1. What kind of mathematical function is this? Explain your reasoning.