Worksheet: Sampling Distributions

1. State whether the quantity is a parameter or a statistic, and give the correct notation:

(a) Average household income for all houses in the US, using data from the US Census.
(b) Correlation between height and weight for players on the 2010 Brazil World Cup team, using data from all 23 players on the roster.
(c) Proportion of people who use an electric toothbrush, using data from a sample of 300 adults.
(d) Proportion of registered voters in a county who voted in the last election, using data from the county voting records.
(e) Average number of television sets per household in North Carol

2. The following figures show different sampling distributions. Estimate the value of the population parameter and estimate the standard error for the sample statistic.

(a) Figure (a) shows sample proportions from samples of size $n = 40$ from a population.
(b) Figure (b) shows sample means from samples of size $n = 30$ from a population.
(c) Figure (c) shows sample means from samples of size $n = 100$ from a population.
(d) Figure (d) shows sample proportions from samples of size $n = 180$ from a population.

3. The following refer to the above graphs:

(a) Using the sampling distribution shown in Figure (a), how likely are these sample proportions:
   (a) $\hat{p} = 0.1$  
   (b) $\hat{p} = 0.35$  
   (c) $\hat{p} = 0.6317$

(b) Using the sampling distribution shown in Figure (b), how likely are these sample means:
   (a) $\bar{x} = 70$  
   (b) $\bar{x} = 100$  
   (c) $\bar{x} = 140$

(c) Using the sampling distribution shown in Figure (c), how likely are these sample means:
   (a) $\bar{x} = 250$  
   (b) $\bar{x} = 305$  
   (c) $\bar{x} = 315$

(d) Using the sampling distribution shown in Figure (d), how likely are these sample proportions:
   (a) $\hat{p} = 0.72$  
   (b) $\hat{p} = 0.88$  
   (c) $\hat{p} = 0.95$
4. Give the correct notation for the quantity described and give its value.

(a) Proportion of families in the US who were homeless in 2010. The number of homeless families in 2010 was about 170,000 while the total number of families is given in the 2010 Census at 78 million.

(b) Average enrollment in charter schools in Illinois. In 2010, there were 95 charter schools in the state of Illinois and the total number of students attending the charter schools was 30,795.

(c) Proportion of US adults who own a cell phone. In a survey of 2252 US adults, 82% said they had a cell phone.

(d) Correlation between age and heart rate for patients admitted to an Intensive Care Unit. Data from the 200 patients gives a correlation of 0.037.

(e) Mean number of cell phone calls made or received per day by cell phone users. In a survey of 1917 cell phone users, the mean was 13.10 phone calls a day.