Math 148 Quiz Nine Version A

Name:

Answer the following questions:

1. (3 points) For the following, write out either 'True' or 'False'

(a) With a simple random sample, the average of the sample is used to estimate the average of the population.
True.

(b) If the contents of the box do not follow the normal curve, then neither will the probability histogram for the average of the draws.
False.

(c) Doubling the size of the sample will also double the size of the standard error for the sum.
False.

2. A certain town has 75,000 registered voters. A political scientist takes a simple random sample of 600 of these voters. It turns out that 140 people in the sample are republican. Find an 80% confidence interval for the percentage of republicans in the population.

Solution: We use the sample percentage to estimate the population percentage, $\frac{140}{600} \times 100\% = 23.33\%$.

$SE(\%) = \frac{\sqrt{600} \times \sqrt{.233 \times .766}}{600} \times 100\% = 1.72\%$.

So the 80% confidence interval is $23.33\% \pm (1.3 \times 1.72\%)$.

3. Six hundred draws are made at random from a box containing 12,000 tickets. The average of the box is unknown, but the average of the draws was 87.3 with a SD of 2.9. Find a 95% confidence interval for the average of the box.

Solution: We estimate the average of the box by the average of the sample, so 87.3.

$SE(Avg) = \frac{2.9}{\sqrt{600}} = 0.12$

So the 95% confidence interval is $87.3 \pm (2 \times 0.12)$.