

Stat 123 Midterm 1 (Practice Test)

Monday, February 6, 2023

Duration: 4:30 pm to 5:20 pm + 10 minutes to upload submissions due by 5:20 pm.

- The test is 40 minutes long + 10 minutes to upload. if you have a CAL time accommodation, you can add that to your 40 minutes time limit.
- You should write directly on the test paper. Once you are done with the test. Then take pictures of your handwritten and upload them using the provided Dropbox named Midterm1 in Brightspace.
- You can find the Dropbox in Brightspace=> Course Tools => Assignments => Midterm1.
- You should also give your paper test to the invigilator.
- You must have your test solutions uploaded to the Brightspace Dropbox by no later than 5:20 pm unless you have a CAL time accommodation.

1. A Victoria resident wants to determine the proportion of Victoria households that still have their holiday decorations up in February.

- (a) Describe how the resident could perform a census?
- (b) Describe how the resident could perform a stratified random sample.
- (c) What is the population parameter of interest?
- (d) Suppose the resident performed a simple random sample of 230 households and found that 76 still had their holiday decorations up. Compute the observed value of the test statistic that is appropriate for estimating the population parameter. Round your answer to 2 decimal places.
- (e) Estimate the margin of error associated with a 95% confidence level. Round your answer to 2 decimal places.

2. A journalist is trying to determine the average age of the BC residents who have received fines for violating restrictions related to COVID-19. He solicits data from a local police department and records the following age.

14; 65; 22; 34; 17; 75

- (a) What is the population of interest?
- (b) What is the parameter of interest?
- (c) What is the statistic that should be used to estimate the parameter?
- (d) What is the observed value of the statistic?

3. Suppose you were interested in the mean weight of all cats (including house cats, cougars, lions etc...).

- (a) Give an example of a biased sample you could use to help estimate the population mean.
- (b) Is there a large amount of variability in the population? If yes, what could you do to account for this?

4. A farmer wants to determine the proportion of carrot seeds planted in her field that successfully grow into carrots. It would take too much time to count the total amount of seeds planted in the field and the total yield of carrots that result. Thus, she decides that she needs to take a sample to estimate this proportion.

- (a) State the population and the variable of interest to this farmer.
- (b) Give an example of a way the farmer could perform a convenience sample.
- (c) Give an example of a way the farmer could perform a simple random sample.
- (d) Give an example of a way the farmer could perform a stratified random sample.
- (e) What is the population proportion of interest? What would be a good statistic to use to estimate the population parameter?

5. A student wants to estimate the mean age in a population of fresh graduates. He collected samples from 450 fresh graduations for the mean age. The mean age was 23 for the sample size 450.

- (a) Estimate the margin of error associated with a 90% confidence level for this estimate. Round your answer to 2 decimal places.
- (b) Compute a 90% confidence interval for this estimate.