

1. Below is a description of a statistical study. Answer the following questions about this study.

In a Harris Interactive survey of 1,006 randomly selected adults, 96% say that they wash their hands when in a public restroom.

- (a) [4 points] Is the statistical study an observational study or an experiment? Explain why.
- (b) [2 points] Identify the population of interest.
- (c) [2 points] Identify the sample.
- (d) [2 points] What is the population parameter?
- (e) [2 points] What is the sample statistic?
- (f) [4 points] Are there any biases present in this study? If so, give an example of why the study is biased. If it isn't, explain why.

2. Below is a description of a statistical study. Answer the following questions about this study.

In testing the effectiveness of a blood pressure medication, researchers randomly selected 40 men and 40 women. The men were given the medication while the women were given a placebo. Neither the participants nor the researchers who interacted with them knew who received the medication and who received the placebo.

- (a) [4 points] Is the statistical study an observational study or an experiment? Explain why.
- (b) [4 points] Is the statistical study single-blind, double-blind, or neither? Explain why.
- (c) [4 points] The data indicates that the blood pressure of the participants who received the medication decreased significantly more than those who received the placebo. Can the experimenters conclude that the medication is effective? Explain why or why not.

3. Below are the grades of 10 students on a test.

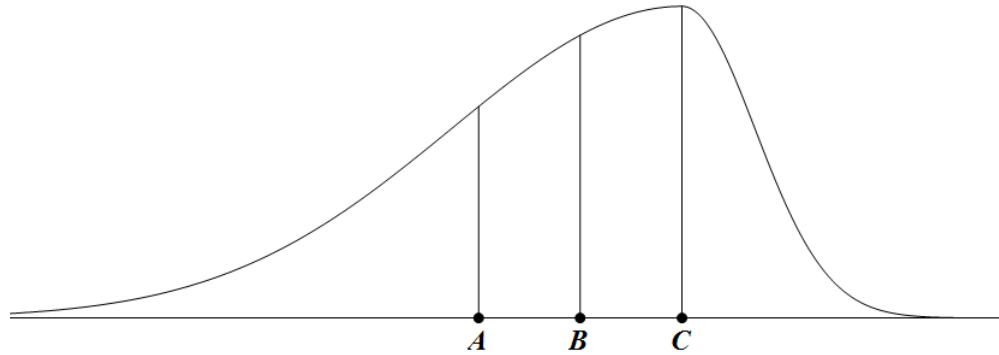
76 89 63 100 94 77 81 94 89 94

(a) [8 points] What is the mean test grade?

(b) [8 points] What is the median test grade?

(c) [4 points] What is the mode test grade?

4. Below is the distribution of a data set.



(a) [4 points] Is the distribution symmetric, left-skewed, or right-skewed? Justify your answer.

(b) [8 points] Does the point **A** represent the mean, median, or mode of the distribution? Justify your answer.

(c) [8 points] Does the point **B** represent the mean, median, or mode of the distribution? Justify your answer.

(d) [8 points] Does the point **C** represent the mean, median, or mode of the distribution? Justify your answer.

5. The winners of the Academy Award for Best Actor since 2011 are listed below along with their age when they won.

Actor	Age
Colin Firth	50
Jean Dujardin	39
Daniel Day-Lewis	55
Matthew McConaughey	44

- (a) [4 points] Is the variable Actor a quantitative variable or a qualitative variable? Justify your answer.

- (b) [4 points] Is the variable Age a quantitative variable or a qualitative variable? Justify your answer.

- (c) [4 points] What is the mean age of the past four Best Actor winners?

(d) [8 points] What is the standard deviation of the ages of the past four Best Actor winners?

(e) [4 points] Michael Keaton, who is 63 years old, is nominated for Best Actor at the 87th Academy Awards, which will be awarded in 2015. ***Without performing any calculations***, will the standard deviation of the ages of the winners of the Academy Award for Best Actor since 2011 increase or decrease? Justify your answer.