STAT 1	Name (Print):
Fall 2020 Midterm Exam 1	Last 4 digits of SID:
Instructions:	
	and open notes. You may not receive assistance from other people, or question and answer sites.
• There are 90 possible poi	nts. Each question part shows how many points it is worth.
in Canvas for tutorial vio	ase StatCrunch to complete this exam. See the StatCrunch page doos. If you prefer, you are also welcome to use Excel or another You may also work by hand.
taking a screenshot of ar	work on this exam! If you are working in StatCrunch, this includes by output and pasting it into your exam document. For incorrect will be awarded for work shown.
• Your exam must be typed may submit a Word docu	d. Any graphs or tables should be pasted in from StatCrunch. You ment or PDF.
• Since we are online, yo to the following exam	our submission of this exam serves as your signed agreement honesty policy:
Honesty Statement and Ple	${f edge}$ :
sites for the full duration of the	r aid or assistance from other students or online question and answer e exam. Everything I have written on this exam represents my own sknowing that infringements on the University's Academic Integrity expulsion.
Signature:	Date:

Levels.Treatments.

## Part I

1.	(4 points) When is is appropriate to use Chebyshev's Rule?
2.	. (4 points) When is is appropriate to use the Empirical Rule?
3.	The whitefly, which causes defoliation of shrubs and trees and a reduction in salable crop yields has emerged as a pest in Southern California. In a study to determine factors that affect the life cycle of the whitefly, an experiment will be conducted in which whiteflies are placed on two different types of plants at three different temperatures. The researchers are interested in the total number of eggs laid by caged females under each treatment.  (a) (2 points) Is this an observational study or an experiment? Explain.
	<ul> <li>(b) (8 points) Identify the:</li> <li>Experimental units.</li> <li>Response variable.</li> <li>Factor(s).</li> </ul>

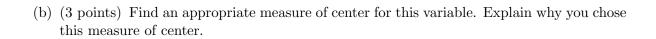
4. (5 points) Write a few sentences discussing something interesting you've learning in this class.

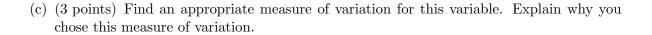
## Part II

For this part of the exam, you will work with data on roller coasters. The StatCrunch link and link to download this data for use with other software are available in Canvas. This data gives information on a sample of 61 roller coasters from a number of different theme parks. The variables are:

- Park: the theme park where the roller coaster can be found
- State / Country: the state and country where the theme park can be found
- Duration: length of time the ride lasts (seconds)
- Speed: the roller coaster's top speed (miles per hour)
- Height: the roller coaster's top height (feet)
- Drop: longest single drop on the roller coaster (feet)
- Length: total track length (feet)
- Yr Opened: year the roller coaster opened
- Inversion: whether or not riders on the roller coaster go upside down
- 5. Suppose you wanted to collect your own data on how fun it is (or isn't, if you don't enjoy that sort of thing) to ride different roller coasters. For each coaster you ride, you will give it a rating from 1-10.
  - (a) (8 points) Describe how you might get a random sample of roller coasters to ride. Defend your approach by considering the pros and cons.
  - (b) (3 points) What type of sampling did you recommend?
- 6. Choose one qualitative variable from the roller coaster data. State clearly which variable you chose.
  - (a) (3 points) Obtain a relative frequency distribution of this variable.
  - (b) (4 points) Obtain a graph of this variable. Explain why you chose this type of graph.
  - (c) (3 points) Find an appropriate measure of center for this variable. Explain why you chose this measure of center.

7.	Choose one quantitative variable from the roller coaster data. State clearly which variable you chose.
	(a) (3 points) Create a histogram for this variable.





(d) (4 points) Interpret the measure of center and the measure of variation you found in the previous two problems.

(e) (5 points) Find the five-number summary for this variable. What is the 50th percentile?

(f) (4 points) Create a box plot for this variable.

- 8. Choose two variables for a regression. State clearly which variables you chose. (Hint: this will be easier if you don't choose Yr Opened as one of your variables.)
  - (a) (4 points) Why did you choose these two variables? (Why might their relationship be interesting?)

(b) (3 points) Which variable will be the predictor and which will be the response? Why?

(c) (6 points) Create a scatter plot for these two variables. Is it appropriate to perform a regression? Explain.

(d) (7 points) Find the regression equation for these variables. Interpret the slope and intercept.

(e) (4 points) What is the change in your response variable for a 100 unit change in your predictor variable? Be sure to write your answer in the context of the variables you chose.