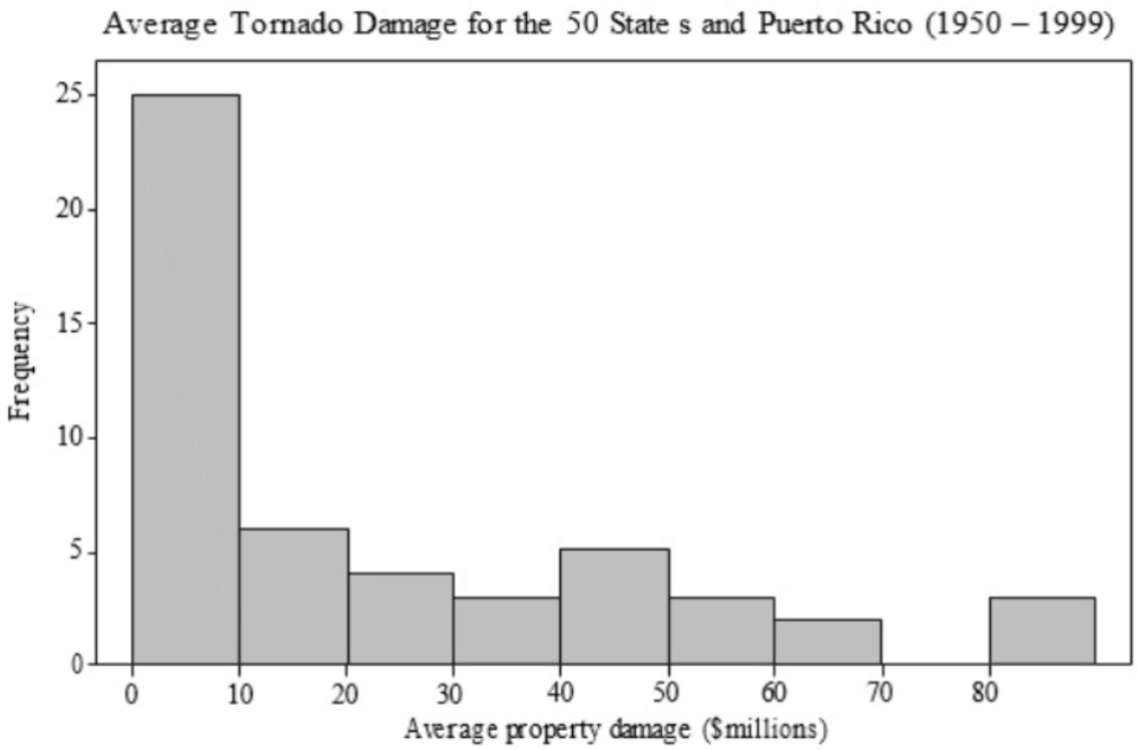
Problem Set #1 - Collecting and Exploring Data

The following problems will cover material discussed in Week 1. You must answer each question correctly to earn credit on the question. You have three attempts per question.

Part 1

The following is a histogram showing the distribution per year of the cumulative property damage caused by tornadoes over the period 1950 to 1999 in each of the 50 states and Puerto Rico.



Question 1

Homework • Answered • Due Today, 11:59 PM

Which of the following correctly describes the histogram?

Select an answer and submit. For keyboard navigation, use the up/down arrow keys to select an answer.

a	The histogram has a center of approximately 50 million dollars.

b	The data are skewed to the right.	✓ Your answer
c	The histogram shows one lower outlier between 0 and 10 million dollars.	
d	The data should have been represented with a bar chart instead.	

Answered - Correct! • **2** attempts left

Resubmit

Part 2

A company was experiencing a chronic weld-defect problem with a water-outlet-tube assembly. Each assembly manufactured is leak tested in a water tank. Data were collected on a gap between the flange and the pipe for 6 bad assemblies that leaked (failed leak test) and 6 good assemblies (passed leak test). The data are shown below.

Pass/Fail Leak Test	Data
Fail	0.290
Fail	0.104
Fail	0.207
Fail	0.145
Fail	0.104
Fail	0.124
Pass	0.207
Pass	0.124
Pass	0.062
Pass	0.301
Pass	0.186
Pass	0.124

Question 2

Homework • Answered • Due Today, 11:59 PM

Calculate the sample **mean** of the six **failed** assemblies.

Round your final answer to three decimal places. Avoid rounding at intermittent steps of the calculation.

Type your numeric answer and submit

0.162

You are correct

Answered - Correct! • **2** attempts left

Resubmit

Question 3

Homework • Answered • Due Today, 11:59 PM

Calculate the sample **median** of the six **passed** assemblies.
Round your final answer to three decimal places. Avoid rounding at intermittent steps of the calculation.

Type your numeric answer and submit

0.155

You are correct

Answered - Correct! • **2** attempts left

Resubmit

Question 4

Homework • Answered • Due Today, 11:59 PM

Calculate the sample **standard deviation** for the entire data set (all 12 observations).

Round your final answer to three decimal places. Avoid rounding at intermittent steps of the calculation.

Type your numeric answer and submit

0.075

You are correct

Answered - Correct! • **2** attempts left

Resubmit

Part 3

The set of 40 values has a sample mean of 450, a sample median of 443, and a sample standard deviation of 32.

Question 5

Homework • Answered • Due Today, 11:59 PM

Consider a transformation of the data set described above where every observation in the set was increased by 20 units. Which of the following statements is true regarding the mean of the **transformed** data set?

Select an answer and submit. For keyboard navigation, use the up/down arrow keys to select an answer.

a	The sample mean of the transformed data set will be equal to 450.
b	The sample mean of the transformed data set will be equal to 470. ✓ Your answer
c	The sample mean of the transformed data set is impossible to determine without knowing the individual values in the data set.
d	The sample mean and sample median of the transformed data set will be equal.

Answered - Correct! • **2** attempts left

Resubmit

Question 6

Homework • Answered • Due Today, 11:59 PM

Consider a transformation of the data set described above where every observation in the set was increased by 20 units. Which of the following statements is true regarding the standard deviation of the **transformed** data set?

Select an answer and submit. For keyboard navigation, use the up/down arrow keys to select an answer.

a	The standard deviation of the transformed data set will be 32. ✓ Your answer
b	The standard deviation of the transformed data set will be 52.
c	The standard deviation of the transformed data set will be 36.47.
d	The standard deviation of the transformed data set is impossible to determine without knowing the individual values.

Answered - Correct! • **1** attempt left

Resubmit

Question 7

Homework • Answered • Due Today, 11:59 PM

Suppose only the maximum value in the original dataset was increased by 40 units. Which of the following statements is true?

Select an answer and submit. For keyboard navigation, use the up/down arrow keys to select an answer.

a	The mean of this new data set would be 490.
b	The standard deviation of this new data set would be 72.
c	The median of the new data set would increase compared to the original data set, but the mean of the new and original data sets would be equal.
d	The median of this new data set would be 443. ✓ Your answer

Answered - Correct! • **2** attempts left Resubmit

Part 4

Identify whether each of the following variables is quantitative or categorical.

Question 8

Homework • Answered • Due Today, 11:59 PM

The price in dollars of statistics textbooks.

Select an answer and submit. For keyboard navigation, use the up/down arrow keys to select an answer.

a	Quantitative ✓ Your answer
b	Categorical

Answered - Correct! • **2** attempts left Resubmit

Question 9

Homework • Answered • Due Today, 11:59 PM

The working status of a computer part (working/not working).

Select an answer and submit. For keyboard navigation, use the up/down arrow keys to select an answer.

a	Quantitative

Answered - Correct! • **2** attempts left Resubmit

Question 10
Homework • Answered • Due Today, 11:59 PM

The gender identity of faculty in the mechanical engineering department.

Select an answer and submit. For keyboard navigation, use the up/down arrow keys to select an answer.

a Quantitative

b Categorical ✓ Your answer

Answered - Correct! • **2** attempts left Resubmit

Question 11
Homework • Answered • Due Today, 11:59 PM

The number of miles until failure of a certain brand of tires.

Select an answer and submit. For keyboard navigation, use the up/down arrow keys to select an answer.

a Quantitative ✓ Your answer

b Categorical

Answered - Correct! • **2** attempts left Resubmit

Part 5

A sample of 26 offshore oil workers took part in a simulated escape exercise, resulting in the accompanying data on time (sec) to complete the escape:

Use R to create a histogram. Copy the data and code below and run the code in R.

```
time <-
c(384,352,356,360,378,425,324,397,400,372,376,370,364,366,364,415,339,394,391
,368,377,358,352,408,419,399)
```

Question 12

Homework • Answered • Due Today, 11:59 PM

Fill in the Blanks

Type your answers in all of the blanks and submit

X_2 X^2 Ω

Calculate the mean and standard deviation of the data set constructed in R. Hint: use the functions mean() and sd().

$\bar{x} =$ 377.23 ✓ Round your answer to two decimal places.

You are correct

$s =$ 25.00 ✓ Round your answer to two decimal places.

You are correct

Answered - Correct! • **1** attempt left

Resubmit

Part 6

Question 13

Homework • Answered • Due Today, 11:59 PM

A student researcher working in a human development lab on campus would like to estimate the proportion of those who work, or go to school on campus that have children. She takes a random sample from each sub-population, faculty, staff, undergraduate students and graduate students and asks "Do you have children that live with you full or part time?" This sample is an example of a

Select an answer and submit. For keyboard navigation, use the up/down arrow keys to select an answer.

a	simple random sample.
b	stratified random sample. ✓ Your answer
c	systematic random sample.
d	voluntary sample.

Answered - Correct! • **1** attempt left

Resubmit

Question 14

Homework • Answered • Due Today, 11:59 PM

You see a woman student standing in front of the student center, now and then stopping other students to ask them questions. She says that she is collecting student opinions for a class assignment. Explain why this sampling method is almost certainly biased.

Select an answer and submit. For keyboard navigation, use the up/down arrow keys to select an answer.

a	This is an observational study. She is observing people's opinions rather than assigning them a stance on the issue.
b	This is a sample survey. She is only getting opinions from a few students when she should be asking everyone's opinion.
c	This is a voluntary response sample. She is only getting responses from people with strong opinions.
d	This is a convenience sample with a voluntary response bias. She is only getting opinions from students who are at the student center at a certain time of the day. ✓ Your answer

Answered - Correct! • **2** attempts left

Resubmit