- **Ch. 1 Test is tomorrow**
- **You can use The formula sheet and your GDC**
- **On some tests I may walk around and ask to check your calculator to make sure there is nothing inappropriate on your calculator.**

<u>Homework</u>

You will turn in all assignments in tomorrow, stapled together in order. Each should have the correct symbol. You will <u>not</u> need to turn in tonight's Review Assignment.
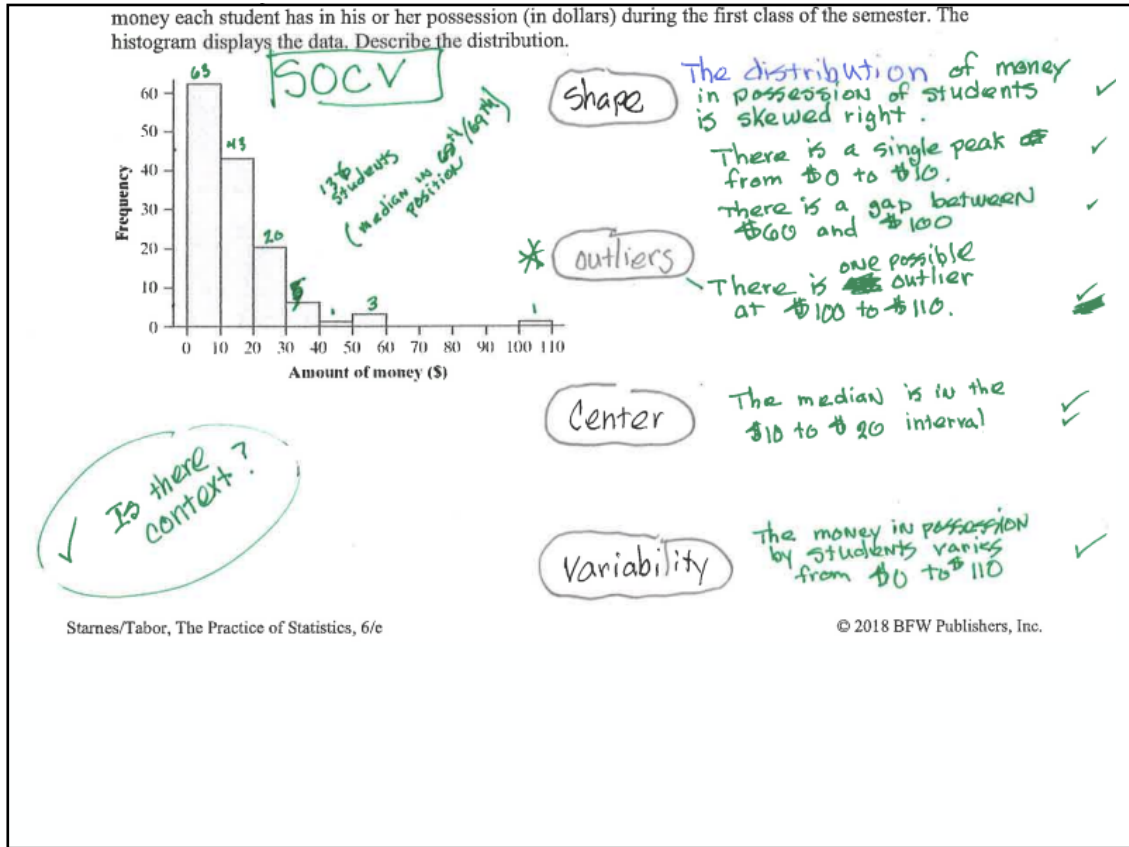

1.5 For

LCQ's

All get scaled to 10 points.

1/3 will get dropped (starting after the 3rd one)

Goal: Learn from them of course

It's way too early to check your grades.

One more thing......

money each student has in his or her possession (in dollars) during the first class of the semester. The histogram displays the data. Describe the distribution.

SOCV

shape — The distribution of money in possession of students is skewed right. ✓

There is a single peak from $0 to $10. ✓

There is a gap between $60 and $100. ✓

outliers — There is one possible outlier at $100 to $110. ✓✓

Center — The median is in the $10 to $20 interval ✓

Variability — The money in possession by students varies from $0 to $110 ✓

Is there context? ✓

Starnes/Tabor, The Practice of Statistics, 6/e   © 2018 BFW Publishers, Inc.

My observations after teaching for 29 years
(my second career)

Too many students wound up tightly about grades

Instead of focusing on developing ....

Gaining Skills

Strong Habits of Mind

Asking questions, etc

Don't lose sight of the big picture.

Now

Once in college

After college

The Big Picture: Where Chapter 1 Fits

- Chapters 1 to 3 cover nearly all of AP® Statistics Topic Outline: I. Exploring Data
- About 20-30% of questions on the AP® exam
- Chapter 1 focuses on describing distributions of categorical and quantitative data & relationships between categorical variables

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  Chapter 2: Modeling Distributions of Data
  Chapter 3: Describing Relationships

Ch. 1
Summary
(Just Watch)

	Type of variable	
	Categorical	Quantitative
Display the distribution	Bar graph Pie chart (sometimes)	
Describe the distribution		

	Type of variable	
	Categorical	Quantitative
Display the distribution	Bar graph Pie chart (sometimes)	Dotplot Stemplot Histogram Boxplot
Describe the distribution		

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	Type of variable	
	Categorical	Quantitative
Display the distribution	Bar graph Pie chart (sometimes)	Dotplot Stemplot Histogram Boxplot
Describe the distribution	Frequency (count) *or* Relative frequency (percent/proportion) in each category	Shape: Roughly symmetric or skewed Outliers: Use 1.5 x *IQR* rule Center: Mean or median Variability: Standard deviation or *IQR*

SOCV

Relationship between...	Two categorical variables	One quantitative and one categorical variable
Display the distributions	Two-way table Side-by-side bar graph Segmented bar graph	
Describe and compare distributions		

Relationship between...	Two categorical variables	One quantitative and one categorical variable
Display the distributions	Two-way table Side-by-side bar graph Segmented bar graph	Parallel Dotplots Back-to-Back Stemplot Histograms on same scale Parallel Boxplots
Describe and compare distributions		

Relationship between…	Two categorical variables	One quantitative and one categorical variable
Display the distributions	Two-way table Side-by-side bar graph Segmented bar graph	Parallel Dotplots Back-to-Back Stemplot Histograms on same scale Parallel Boxplots
Describe and compare distributions	Marginal relative frequencies ********************************* Conditional relative frequencies ********************************* Is there an association?	

Relationship between…	Two categorical variables	One quantitative and one categorical variable
Display the distributions	Two-way table Side-by-side bar graph Segmented bar graph	Parallel Dotplots Back-to-Back Stemplot Histograms on same scale Parallel Boxplots
Describe and compare distributions	Marginal relative frequencies ********************************* Conditional relative frequencies ********************************* Is there an association?	Shape: Roughly symmetric or skewed Outliers: Use 1.5 x IQR rule Center: **Compare** mean or median Variability: **Compare** standard deviation or IQR

Ch. Tests will
mirror AP exam

- M/C

  Free Response

Exam Format

Section I

Multiple Choice — 40 Questions | 1 Hour, 30 Minutes | 50% of Exam Score

- Individual Questions

Section II

Free Response — 6 Questions | 1 Hour, 30 Minutes | 50% of Exam Score

- 5 Short-Answer Questions
- 1 Investigative Task

- FRAPPY! Analyzing categorical data ✓
- Chapter Review ✓
  - Summary ✓
  - What Did You Learn? ✓
  - Exercises keyed to examples and learning targets

videos for each problem available

FRAPPYs

Utilizing **F**ree **R**esponse

AP Problems (**Y**ay!)

WHEN SHOULD YOU FRAPPY?

FRQs as "Test Preparation"

Teach Review TEST   Teach Review TEST   Teach Review TEST   Teach Review TEST   Teach Review TEST   Review Review

| Descriptive Stats | Producing Data | Probability | Inference | Exam Prep | AP Exam |

Sep Oct   Nov   Dec   Jan   Feb   Mar   Apr   May
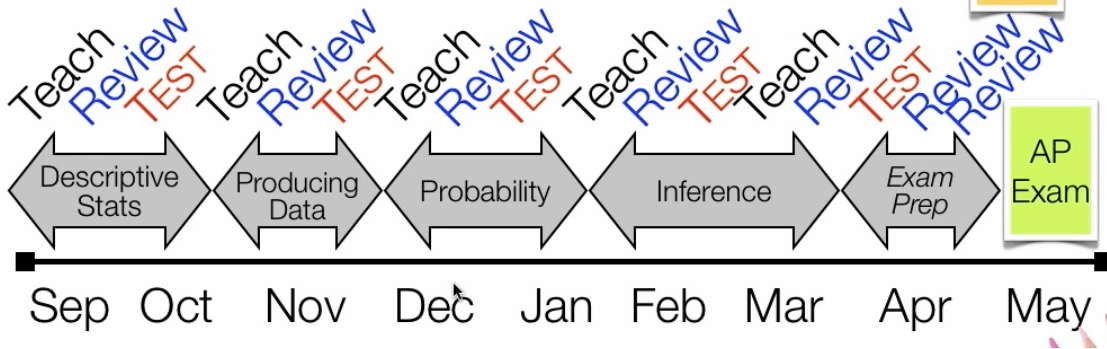
WHEN SHOULD YOU FRAPPY?

FRQs as *Formative Assessment*

FRQ   FRQ   FRQ   FRQ   FRQ   FRQ

Teach Review TEST   Teach Review TEST   Teach Review TEST   Teach Review TEST   Teach Review TEST   Review Review

| Descriptive Stats | Producing Data | Probability | Inference | Exam Prep | AP Exam |

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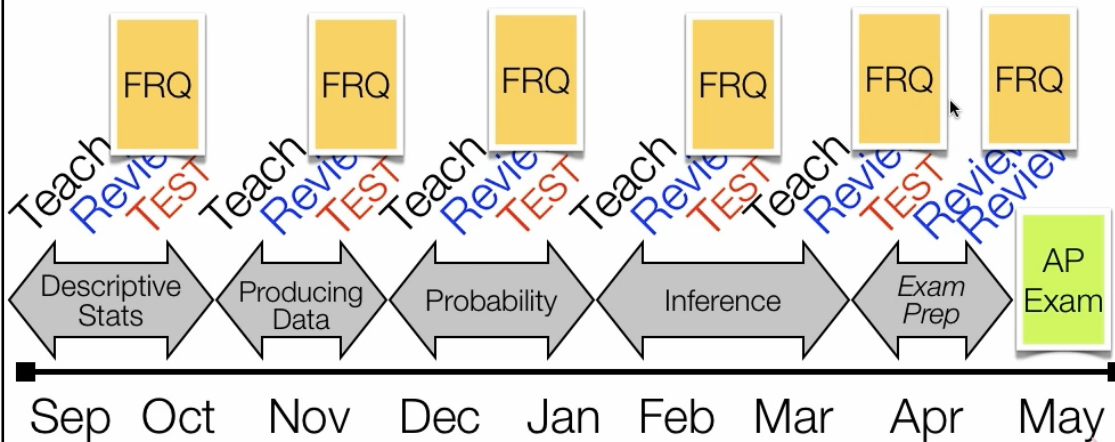
Free response

Scoring Rubric

3

a) E

b) P

c) E

WHERE AM I GOING?   STEP 1

- 15 Minutes to work on Problem

- READ the ENTIRE problem.

- Determine "**Intent of Question**"
  - *What are they looking for?*

- Formulate Response
  - **Proper application of concept(s)**
  - **Clear Communication**
  - **Context, Context, Context!**

Chapter 1 FRAPPY!

Directions: Show all your work. Indicate clearly the methods you use, because you will be scored on the correctness of your methods as well as on the accuracy and completeness of your results and explanations.

Using data from the 2000 census, a random sample of 348 U.S. residents aged 18 and older was selected. Among the variables recorded were gender (male or female), housing status (rent or own), and marital status (married or not married).

The two-way table below summarizes the relationship between gender and housing status.

	Male	Female	Total
Own	132	122	254
Rent	50	44	94
Total	182	166	348

(a) What percentage of the males in the sample own their home?

Model Solution

ANSWERS

Descriptions of how to award
E P or I
on each part.

FYI: They don't expect all papers with top scores to look exactly like this.

You will keep your Frappy. Consider making comments on as we look at the Model Solution and 2 Samples

Student Sample 1

(a) What percentage of the males in the sample own their home?

72.5% of males in the sample own their own homes.

(b) Make a graph to compare the distribution of housing status for males and females.
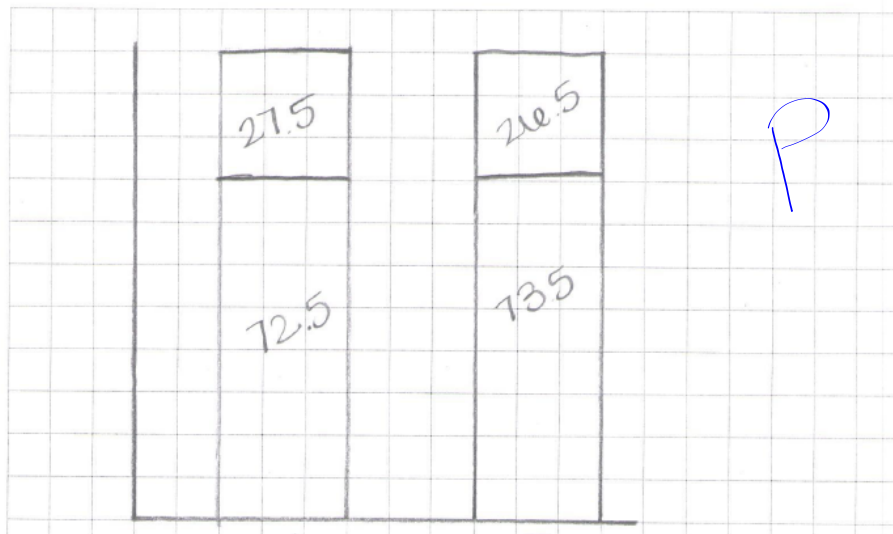
Sample 1

(c) Using your graph from part (b), describe the relationship between gender and housing status.

There seems to be no association between gender and housing status. Both are relatively the same so you cannot tell if being a male specifically means you are more likely to own a house, or vice versa.

E

(d) The two-way table below summarizes the relationship between marital status and housing status.

	Married	Not Married	Total
Own	172	82	254
Rent	40	54	94
Total	212	136	348

For the members of the sample, is the relationship between marital status and housing status stronger or weaker than the relationship between gender and housing status that you described in part (c)? Justify your choice using the data provided in the two-way tables.

There is a stronger association between marital status and housing status than between gender and housing status. While the percentage of male and female homeowners was nearly identical, 81% of married induviduals own their own home and only 60% of not married induviduals own their home (a difference of nearly 20%). This tells us that married induviduals are more likely to own their home

E

Chapter 1 FRAPPY!
Student Samples Commentary

Sample #1

In part (a), the response provides the correct percentage, but does not include any supporting work. Part (a) was scored partially correct (P). In part (b), the response includes an accurate segmented bar chart that uses relative frequencies. However, because the labeling is incomplete, part (b) was scored partially correct (P). In part (c), the response correctly states that there is no association because the conditional distributions are "relatively the same." Part (c) was scored essentially correct (E). In part (d), the response correctly answered that the relationship between marital status and housing status was stronger by describing the association with numerical evidence (81% and 60%) and comparing the two associations ("a difference of nearly 20%" when conditioning by marital status versus "nearly identical" when conditioning by gender). Part (d) was scored essentially correct (E). With two parts essentially correct and two parts partially correct, the entire answer was judged as substantial and earned a score of 3.
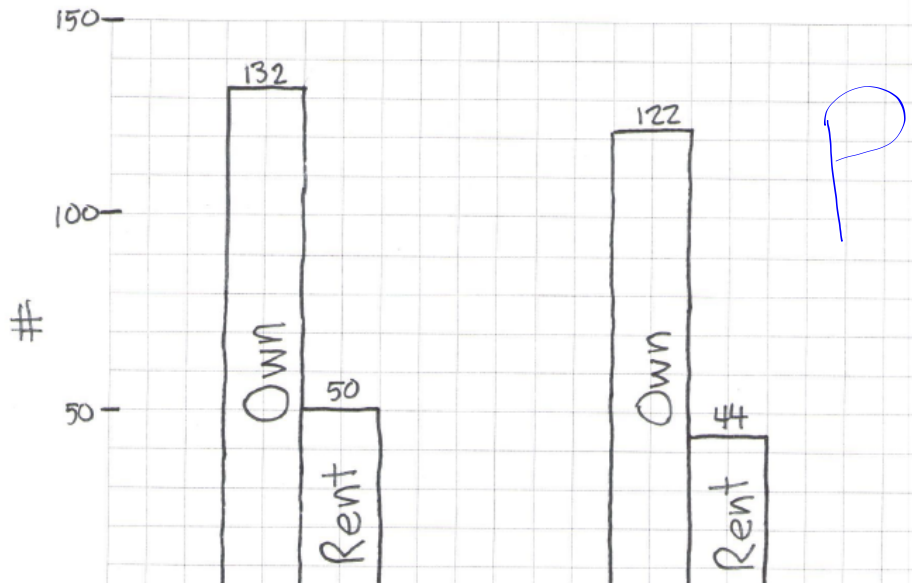
Sample 2

(a) What percentage of the males in the sample own their home?

$132/182 = 72.5\%$

E

(b) Make a graph to compare the distribution of housing status for males and females.

Sample 2

(c) Using your graph from part (b), describe the relationship between gender and housing status.

There is no association between gender and housing status because both males and females are more likely to own than rent.

P

(d) The two-way table below summarizes the relationship between marital status and housing status.

	Married	Not Married	Total
Own	172	82	254
Rent	40	54	94
Total	212	136	348

For the members of the sample, is the relationship between marital status and housing status stronger or weaker than the relationship between gender and housing status that you described in part (c)? Justify your choice using the data provided in the two-way tables.

The association between marital status and housing status is stronger than the one between gender and housing status. Couples that are married are more likely to own a house than those who are not married.

E
P
P
I

Sample #2

In part (a), the response provides the correct percentage and includes supporting work. Part (a) was scored essentially correct (E). In part (b), the response includes an appropriate type of graph with good labels, but uses frequencies (counts) rather than relative frequencies (percents), making it harder to compare the conditional distributions. Part (b) was scored partially correct (P). In part (c), the response correctly states that there is no association because the distribution for males is similar to the distribution for females (both are more likely to own). However, even if both genders are more likely to own than rent, it is still possible that there is an association (e.g., if 70% of males own and 90% of females own). Because the response didn't specifically compare the percentage of males and percentage of females that own their home, part (c) was scored partially correct (P). In part (d), the response correctly answered that the relationship between marital status and housing status was stronger. However, there is no justification of the association between marital status and housing status and no comparison of the two associations using graphical or numerical evidence. Part (d) was scored incorrect (I). With one part essentially correct, two parts partially correct, and one part incorrect, the entire answer was judged as developing and earned a score of 2.

Grading Tests

A balance between "school grades" and AP Grades
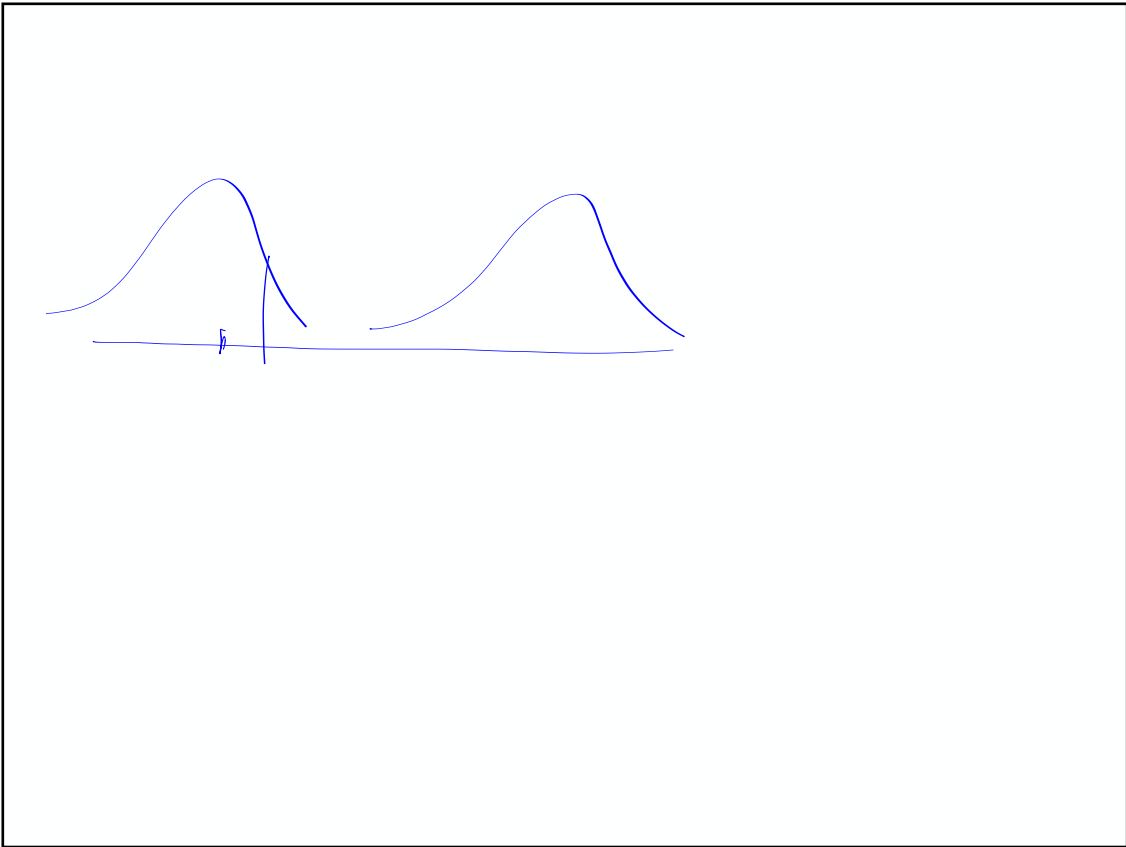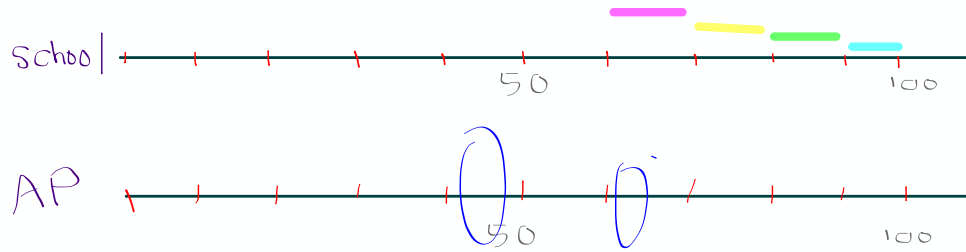
Assignment : Chapter Review exercises

T11 to T14

Check answers in back.

Consider watching the solutions videos on each.

<u>Homework</u>

You will turn in all assignments in tomorrow but you will <u>not</u> need to turn in the Review Assignment