Student: _____
Date: _____

Instructor: Andreas Lazari
Course: Math2620 F - Fall 2018

Assignment: Chapter 2.1 and 2.2-
Homework

1. An airline offers discounted flights from Atlanta to five American cities. Below is a frequency distribution of the number of tickets purchased for each location based on a random sample of purchased tickets. Complete parts (a) through (e).

Response	Frequency
Las Vegas	1150
Orlando	1117
New York	831
Chicago	700
San Diego	321

4119 Total

(a) Construct a relative frequency distribution of the data.

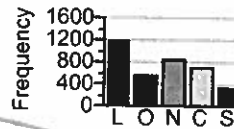| Response	Relative Frequency	
Las Vegas	0.279	$1150/4119 = 0.27919$
Orlando	0.271	$1117/4119 = .27118$
New York	0.202	$831/4119 = .20174$
Chicago	0.170	$700/4119 = .16994$
San Diego	0.078	$321/4119 = .07793$

(Round to three decimal places as needed.)

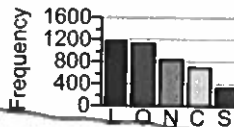**(b)** What proportion of the tickets were for New York?

0.202

(Round to three decimal places as needed.)

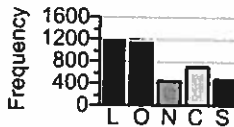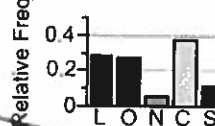**(c)** Construct a frequency bar graph. Choose the correct answer below.
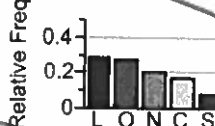
○ **A.**

● **B.**

○ **C.**

(d) Construct a relative frequency bar graph. Choose the correct answer below.

○ **A.**

● **B.**

○ **C.**
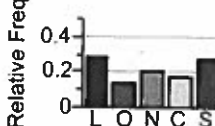
(e) Construct a pie chart. Choose the correct answer below.
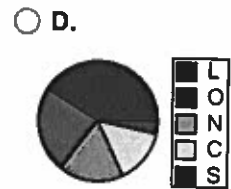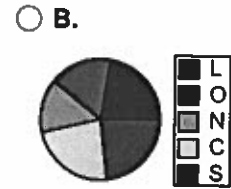
A.

27.1% 2F.9
20.2%
1% 17%

B.

C.

D.
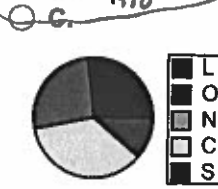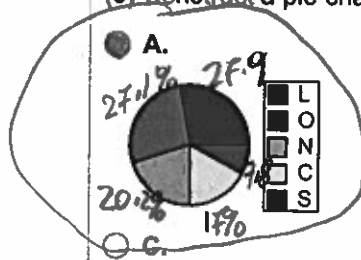
2. A national survey asked people, "How often do you eat out for dinner, instead of at home?" The frequencies were as follows. Complete parts (a) through (g).

Response	Frequency
Never	368
Rarely	512
Sometimes	977
Most of the time	263
Always	61

2181 Total

(a) Construct a relative frequency distribution of the data.

Response	Relative Frequency	
Never	0.169	368/2181
Rarely	0.235	512/2181
Sometimes	0.448	977/2181
Most of the time	0.121	263/2181
Always	0.028	61/2181

(Round to three decimal places as needed.)

(b) What percentage of respondents answered "Always"?

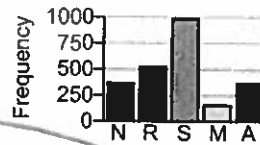___2.8___ %

(Round to one decimal place as needed.)

(c) What percentage of respondents answered "Never" or "Rarely"?

___40.3___ %

(Round to one decimal place as needed.)

$$\frac{368+512}{2181} = \frac{880}{2181} = 0.4034846$$
$$= 40.34846$$
$$\approx \boxed{40.3}$$

(d) Construct a frequency bar graph. Choose the correct answer below.

○ **A.**

● **B.**

○ **C.**
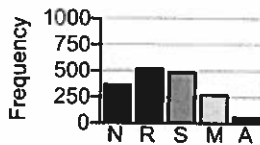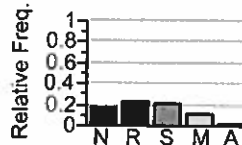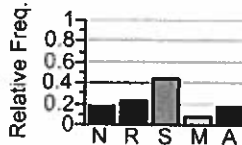
(e) Construct a relative frequency bar graph. Choose the correct answer below.

○ **A.**

○ **B.**

C.
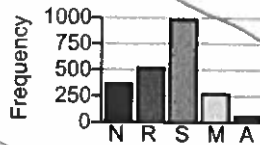
Relative Freq.
1
0.8
0.6
0.4
0.2
0
N R S M A
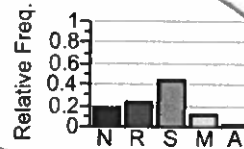
(f) Construct a pie chart. Choose the correct answer below.

A.

N
R
S
M
A

B.

N
R
S
M
A

C.
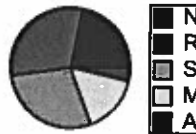

N
R
S
M
A

D.

N
R
S
M
A
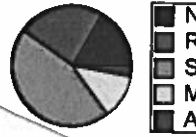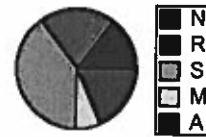
(g) Suppose a person claims that, "2.8% of all people in the nation always eat out." Is this a descriptive or inferential statement?

● inferential

○ descriptive

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3. Is the statement below true or false?

There is not one particular frequency distribution that is correct, but there are frequency distributions that are less desirable than others.

Choose the correct answer below.

○ **A.** The statement is false. There is only one correct frequency distribution for any given data set.

○ **B.** The statement is true. Any correctly constructed frequency distribution is valid. However, some are less desirable because they take up more space.

● **C.** The statement is true. Any correctly constructed frequency distribution is valid. However, some choices for the categories or classes give more information about the shape of the distribution.

○ **D.** The statement is false. All correctly constructed frequency distributions for a given data set are valid and give the same information.

4. Determine whether the following statement is true or false.

The shape of the distribution shown is best classified as skewed left.
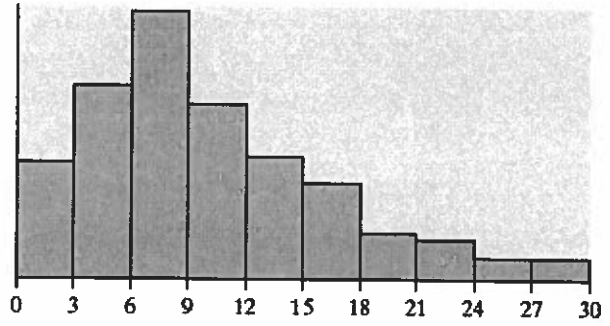
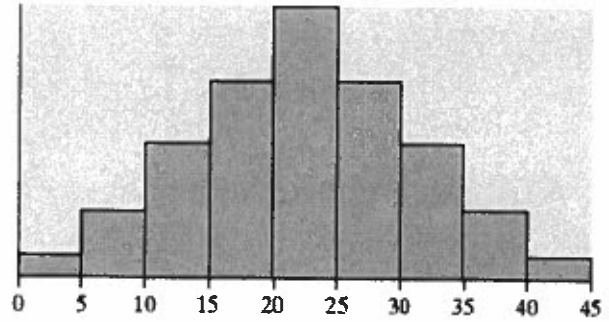Choose the correct answer below.

- **●** False
- ○ True

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5. Determine whether the following statement is true or false.
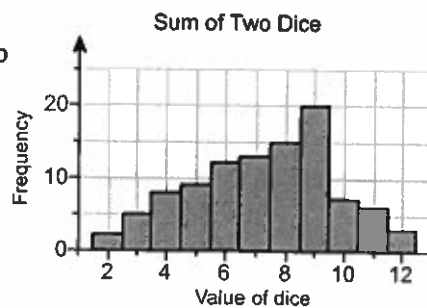
The shape of the distribution shown is best classified as uniform.

Choose the correct answer below.

- ○ True
- **●** False

6. An experiment was conducted in which two fair dice were thrown 100 times. The sum of the pips showing on the dice was then recorded. The frequency histogram to the right gives the results. Use the histogram to complete parts (a) through (f).

Sum of Two Dice

(a) What was the most frequent outcome of the experiment?

_9_

(b) What was the least frequent?

_2_

(c) How many times did we observe a 9?

_20_

(d) How many more 8's were observed than 7's?

_2._

8's — 15
7's — 13   ⇒ 15 − 13 = 2 8's more than 7's.

(e) Determine the percentage of time a 9 was observed.

_20_ %

100 times; $\frac{20}{100} = .20$ or 20%

**(f)** Describe the shape of the distribution. Choose the correct answer below.

○ Skewed right
○ Bell-shaped
○ Uniform
● Skewed left

7. The following frequency histogram represents the IQ scores of a random sample of seventh-grade students. IQs are measured to the nearest whole number. The frequency of each class is labeled above each rectangle. Use the histogram to answers parts (a) through (g).

IQs of 7th Grade Students
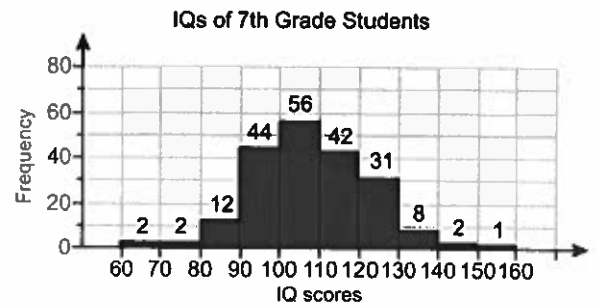
(a) How many students were sampled?

_**200**_ students

$2+2+12+44+56+42+31+8+2+1=200$

(b) Determine the class width.

The class width is _**10**_.

(c) Identify the classes and their frequencies. Choose the correct answer below.

- **A.** 60-69, 2; 70-79, 2; 80-89, 12; 90-99, 44; 100-109, 56; 110-119, 42; 120-129, 31; 130-139, 8; 140-149, 2; 150-159, 1
- ○ **B.** 65, 2; 75, 2; 85, 12; 95, 44; 105, 56; 115, 42; 125, 31; 135, 8; 145, 2; 155, 1
- ○ **C.** 60-70, 2; 70-80, 2; 80-90, 12; 90-100, 44; 100-110, 56; 110-120, 42; 120-130, 31; 130-140, 8; 140-150, 2; 150-160, 1

(d) Which class has the highest frequency?

- ○ **A.** 90-99
- ○ **B.** 100-110
- ○ **C.** 105
- ● **D.** 100-109

(e) Which class has the lowest frequency?

- ○ **A.** 150-160
- ○ **B.** 60-69
- ○ **C.** 155
- ● **D.** 150-159

(f) What percent of students had an IQ of at least 120?

_**21**_ % (Type an integer or a decimal. Do not round.)

At least 120; $31+8+2+1=42$

$\dfrac{42}{200}=.21$ or 21%

(g) Did any students have an IQ of 165?

- ○ **A.** No, because there is a bar in the 150-159 class.
- ○ **B.** Yes, because there is a frequency of a score of 165.
- ○ **C.** Yes, because there is a bar in the 150-159 class.
- ● **D.** No, because there are no bars, or frequencies, greater than an IQ of 160.

Using the TI 83/84 Calculator to do homework problem #8

Stat, 1:Edit and then enter the data in L1.

2nd and Y to access the STATPLOT, Chose 1 for Plot 1, put cursor on "ON" and enter to turn on Plot 1, move arrow down and chose the Histogram (newer calculators the graphs are in one row), then move the cursor to the XList: and do 2nd and 1 to choose L1,
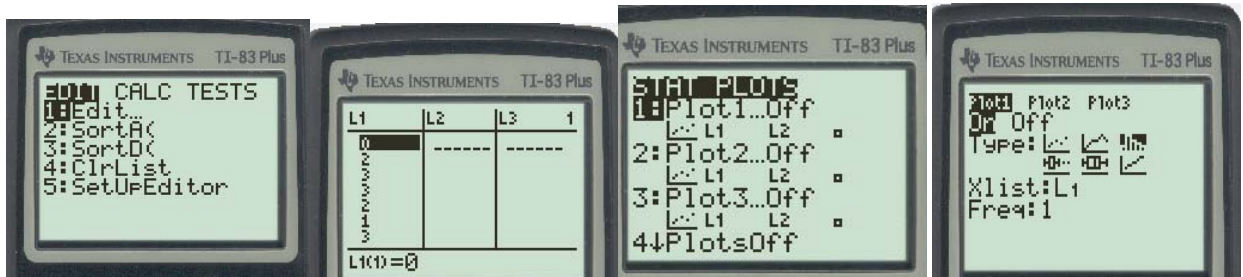
then hit Window to adjust the data for the window, Xmin=0, Xmax=6, Xscl=1, Ymin=-1, Ymax=16, Yscl=1, Xres=1, then hit GRAPH, then TRACE to extract the frequencies, move the arrow to the right to trace the rest of the frequencies.
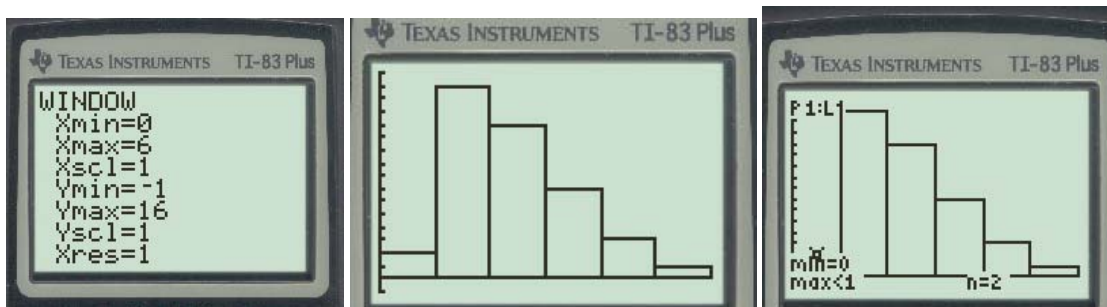
Televisions	Frequency
0	2
1	15
2	12
3	7
4	3
5	1

Below are some videos how to create a histogram on TI 83 or 84.

https://mediaplayer.pearsoncmg.com/assets/sst5e_2_2_4_Histogram_cont_data_by_hand_TI84

https://mediaplayer.pearsoncmg.com/assets/02_02_EX4_ti

8. A researcher wanted to determine the number of televisions in households. He conducts a survey of 40 randomly selected households and obtains the data in the accompanying table. Complete parts (a) through (h) below.
[1] Click the icon to view the table of television counts.

(a) Are these data discrete or continuous? Explain.

    A. The given data are continuous because they can take on any real value.

    B. The given data are continuous because they can only have whole number values.

    ● C. The given data are discrete because they can only have whole number values.

    D. The given data are discrete because they can take on any real value.

(b) Construct a frequency distribution of the data.

Televisions	Frequency
0	2
1	15
2	12
3	7
4	3
5	1

(handwritten data)
0 2 2 3 5 4 2 2 1 1
2 1 3 4 2 1 1 2 2 2
3 3 1 2 2 1 1 1 2 1
3 3 1 1 1 3 1 1 4 0
3

(c) Construct a relative frequency distribution of the data.

Televisions	Relative Frequency
0	0.050
1	0.375
2	0.300
3	0.175
4	0.075
5	0.025

$2/40 = 0.050$
$15/40 = 0.375$
$12/40 = 0.300$
$7/40 = 0.175$
$3/40 = 0.075$
$1/40 = 0.025$

(Type integers or decimals. Do not round.)

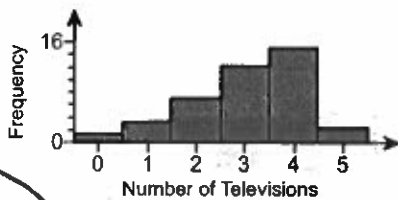**(d)** What percentage of households in the survey have three televisions?

_17.5_ %
(Type an integer or a decimal. Do not round.)

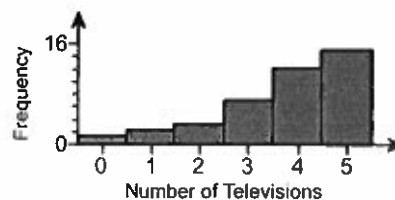**(e)** What percentage of households in the survey have four or more televisions?

_10_ %
(Type an integer or a decimal. Do not round.)

$0.075 + 0.025 = 0.10$

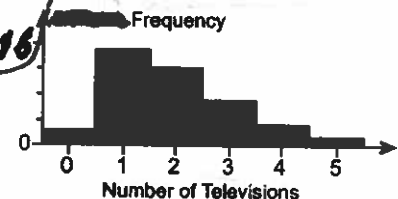**(f)** Construct a frequency histogram of the data. Choose the correct graph below.
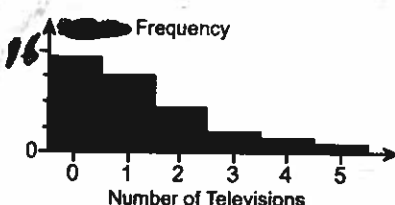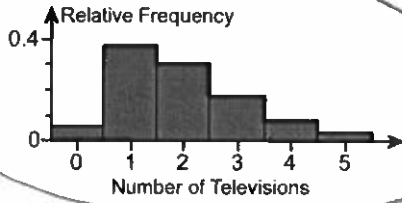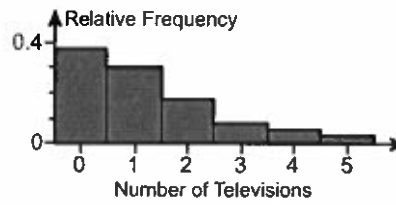
A.

B.

● C.

D.

(g) Construct a relative frequency histogram of the data. Choose the correct graph below.

A. Relative Frequency vs Number of Televisions

B. Relative Frequency vs Number of Televisions

C. Relative Frequency vs Number of Televisions
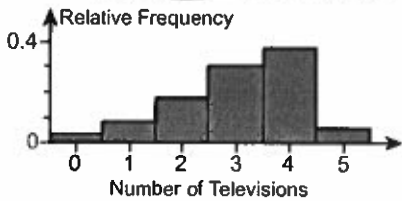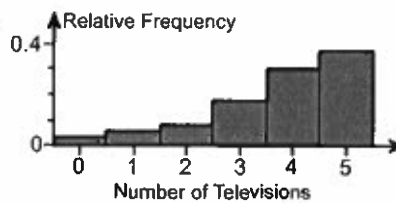
D. Relative Frequency vs Number of Televisions

(h) Describe the shape of the distribution.

The distribution is (1) _Skewed Right._

1: Table of television counts

0	3	2	2	1	1	1	3
3	2	1	4	2	1	3	2
2	1	1	3	1	1	1	2
2	4	0	1	4	5	2	1
1	3	2	1	1	2	2	3

(1) ○ bell-shaped.
    ○ uniform.
   ○ skewed left.
    ● skewed right.

Using the TI 83/84 Calculator to do homework problem #9

Stat, 1:Edit and then enter the data in L1.

2nd and Y to access the STATPLOT, Chose 1 for Plot 1, put cursor on "ON" and enter to turn on Plot 1, move arrow down and chose the Histogram (newer calculators the graphs are in one row), then move the cursor to the XList: and do 2nd and 1 to choose L1,
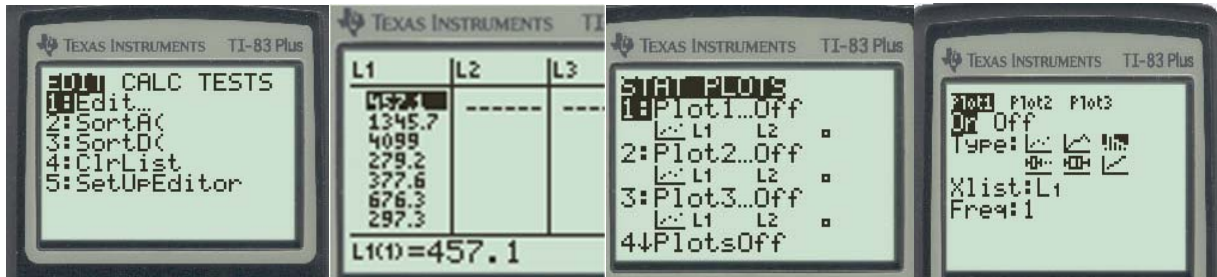
then hit Window to adjust the data for the window, Xmin=100, Xmax=1399.9, Xscl=100, Ymin=-1, Ymax=17, Yscl=1, Xres=1, then hit GRAPH, then TRACE to extract the frequencies, move the arrow to the right to trace the rest of the frequencies.
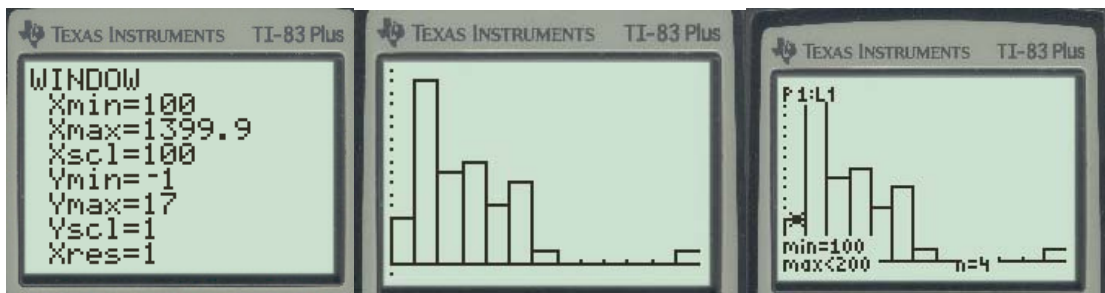
Violent Crimes	Frequency
100-199.9	4
200-299.9	16
300-399.9	8
400-499.9	9
500-599.9	5
600-699.9	7
700-799.9	1

Violent Crimes	Frequency
800-899.9	0
900-999.9	0
1000-1099.9	0
1100-1199.9	0
1200-1299.9	0
1300-1399.9	1

Below are some videos how to create a histogram on TI 83 or 84.

https://mediaplayer.pearsoncmg.com/assets/sst5e_2_2_4_Histogram_cont_data_by_hand_TI84

https://mediaplayer.pearsoncmg.com/assets/02_02_EX4_ti

9. Violent crimes include murder, forcible rape, robbery, and aggravated assault. The data to the right represent the violent-crime rate (crimes per 100,000 population) by region of a certain country. Complete parts (a) through (f) below.

end at 1399.9   *start at 100*

457.1	1345.7	409.9	279.2	377.6	676.3	297.3
644.5	611.7	257.1	488.4	403.9	177.3	261.1
417.2	419.9	616.7	261.8	202.9	665.9	229.9
524.3	277.5	119.6	287.8	338.8	490.2	
465.1	235.3	589.8	704.6	506.8	200.7	
333.7	508.6	467.7	158.9	245.4	120.7	
308.3	326.7	509.7	314.9	383.2	234.3	
635.7	287.2	254.5	622.6	256.7	335.7	

(a) If thirteen classes are to be formed, choose an appropriate lower class limit for the first class and a class width.

An appropriate lower class limit for the first class is (1) ____100____ with a class width of (2) ____100____

(b) Construct a frequency distribution.

| Violent Crimes	Frequency		Violent Crimes	Frequency
100–199.9	4		800–899.9	0
200–299.9	16		900–999.9	0
300–399.9	8		1000–1099.9	0
400–499.9	9		1100–1199.9	0
500–599.9	5		1200–1299.9	0
600–699.9	7		1300–1399.9	1
700–799.9	1			

(c) Construct a relative frequency distribution.

| Violent Crimes	Relative Frequency			Violent Crimes	Relative Frequency	
100–199.9	0.078	4/51		800–899.9	0.000	0/51
200–299.9	0.314	16/51		900–999.9	0.000	0/51
300–399.9	0.157	8/51		1000–1099.9	0.000	0/51
400–499.9	0.176	9/51		1100–1199.9	0.000	0/51
500–599.9	0.098	5/51		1200–1299.9	0.000	0/51
600–699.9	0.137	7/51		1300–1399.9	0.020	1/51
700–799.9	0.020	1/51				

(Round to three decimal places as needed.)

(d) Construct a frequency histogram of the data. Choose the correct histogram below.
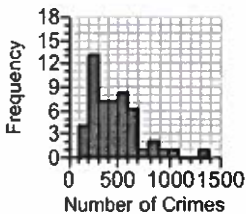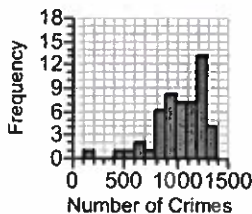
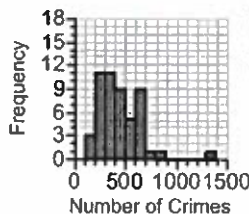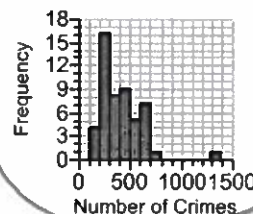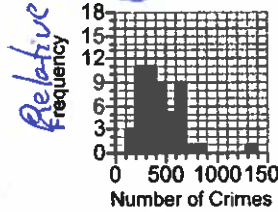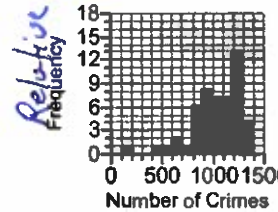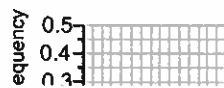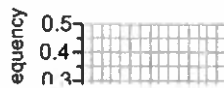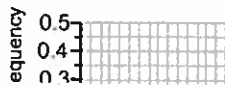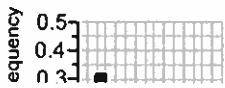○ A.   ○ B.   ○ C.   ● D.

(e) Construct a relative frequency histogram of the data. Choose the correct histogram below.

A
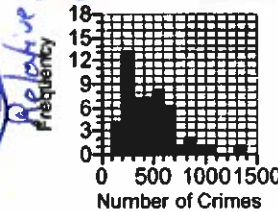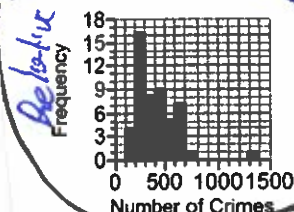
(f) Describe the shape of the distribution. Choose the correct answer below.

● **A.** The distribution is skewed right because the right tail is longer than the left tail.

○ **B.** The distribution is symmetric because the the left and right sides are approximately mirror images.

○ **C.** The distribution is skewed right because the left tail is longer than the right tail.

○ **D.** The distribution is skewed left because the left tail is longer than the right tail.

○ **E.** The distribution is symmetric because the bars in the histograms are all approximately the same height.

○ **F.** The distribution is skewed left because the right tail is longer than the left tail.

(1) ○ 500,   (2) ○ 50.
　　● 100,　　　　○ 500.
　　○ 200,　　　　● 100.
　　○ 0,　　　　　○ 1000.

Using the TI 83/84 Calculator to do homework problem #10(a)

Stat, 1:Edit and then enter the data in L1.

2nd and Y to access the STATPLOT, Chose 1 for Plot 1, put cursor on "ON" and enter to turn on Plot 1, move arrow down and chose the Histogram (newer calculators the graphs are in one row), then move the cursor to the XList: and do 2nd and 1 to choose L1,
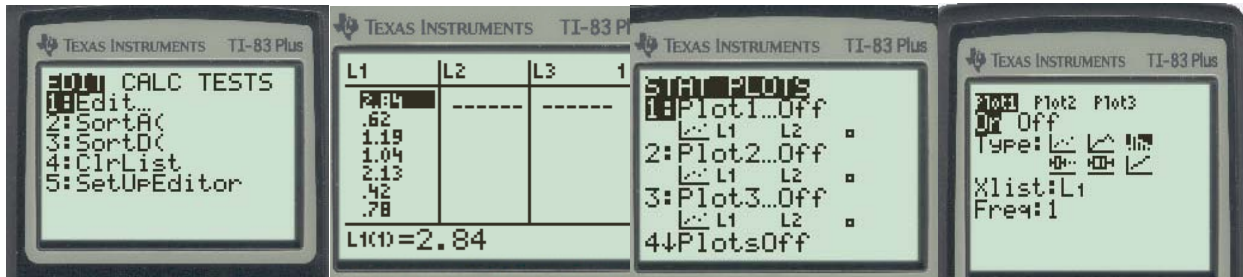
then hit Window to adjust the data for the window, Xmin=0, Xmax=4.5, Xscl=0.5, Ymin=-1, Ymax=10, Yscl=1, Xres=1, then hit GRAPH, then TRACE to extract the frequencies, move the arrow to the right to trace the rest of the frequencies.
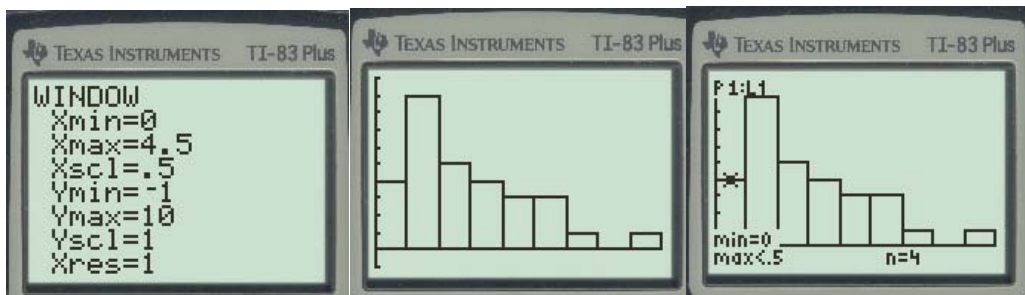
Violent Crimes	Frequency
0 - 0.49	4
0.5 - 0.99	9
1 - 1.49	5
1.5 - 1.99	4
2 - 2.49	3
2.5 - 2.99	3
3 - 3.49	1
3.5 - 3.99	0
4 - 4.49	1

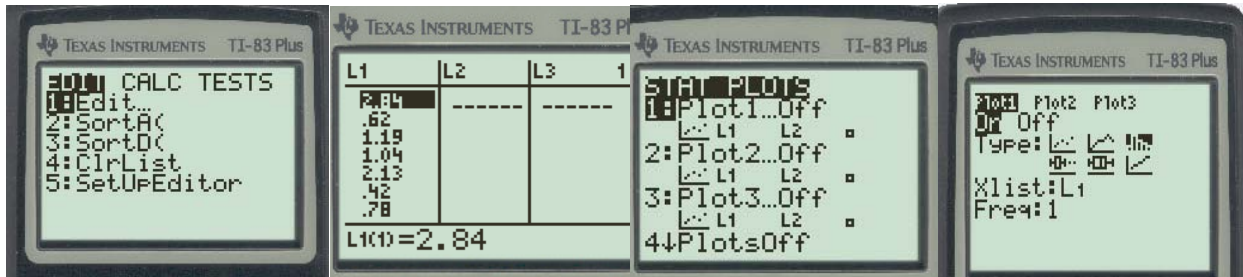**Below are some videos how to create a histogram on TI 83 or 84.**
https://mediaplayer.pearsoncmg.com/assets/sst5e_2_2_4_Histogram_cont_data_by_hand_TI84
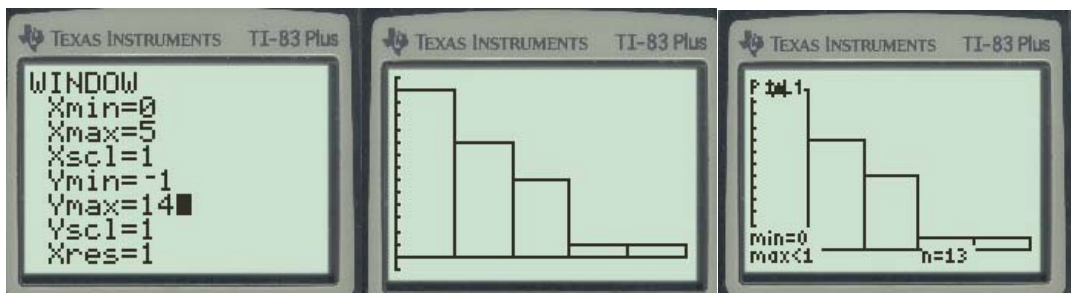https://mediaplayer.pearsoncmg.com/assets/02_02_EX4_ti

Using the TI 83/84 Calculator to do homework problem #10(f)

Stat, 1:Edit and then enter the data in L1.

2nd and Y to access the STATPLOT, Chose 1 for Plot 1, put cursor on "ON" and enter to turn on Plot 1, move arrow down and chose the Histogram (newer calculators the graphs are in one row), then move the cursor to the XList: and do 2nd and 1 to choose L1,

then hit Window to adjust the data for the window, Xmin=0, Xmax=5, Xscl=1, Ymin=-1, Ymax=14, Yscl=1, Xres=1, then hit GRAPH, then TRACE to extract the frequencies, move the arrow to the right to trace the rest of the frequencies.

Violent Crimes	Frequency
0 - 0.99	13
1 - 1.99	9
2 – 2.99	6
3 - 3.99	1
4 – 4.99	1

Below are some videos how to create a histogram on TI 83 or 84.

https://mediaplayer.pearsoncmg.com/assets/sst5e_2_2_4_Histogram_cont_data_by_hand_TI84

https://mediaplayer.pearsoncmg.com/assets/02_02_EX4_ti

10. The accompanying table shows the tax, in dollars, on a pack of cigarettes in 30 randomly selected cities. Complete parts (a) through (g) below.

[2] Click the icon to view the table of data.

(a) Construct a frequency distribution using 9 classes. Note: Take min=0 and max=4.5 to compute the Class With. ; CW=(4.5 − 0)$/9$ = 0.50.
(Type integers or decimals. Do not round.)

Tax		Frequency
0	- 0.49	4
0.5	- 0.99	9
1.0	- 1.49	5
1.5	- 1.99	4
2	- 2.49	3
2.5	- 2.99	3
3	- 3.49	1
3.5	- 3.99	0
4	- 4.49	1

(b) Construct a relative frequency distribution.
(Round to two decimal places as needed.)

Tax		Relative Frequency
0	- 0.49	0.13
0.5	- 0.99	0.30
1	- 1.49	0.17
1.5	- 1.99	0.13
2	- 2.49	0.10
2.5	- 2.99	0.10
3	- 3.49	0.03
3.5	- 3.99	0.00
4	- 4.49	0.03

$4/30 = 0.133333$
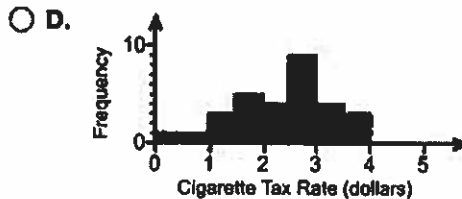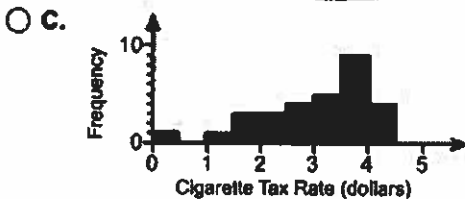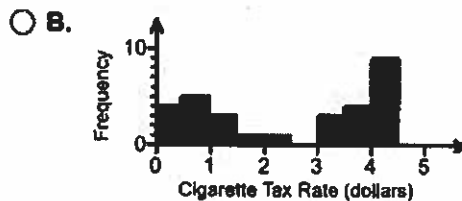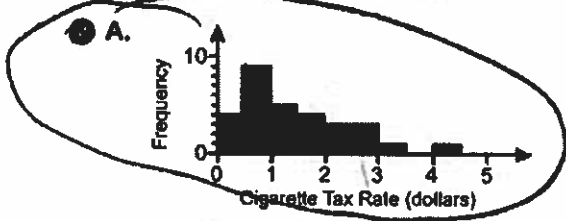$9/30 = 0.30$
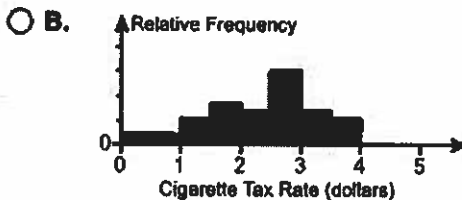$5/30 = 1.666667$
$4/30 = 1.3333$
$3/30 = 0.10$
$3/30 = 0.10$
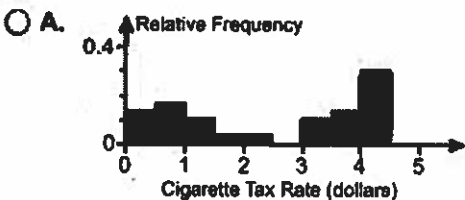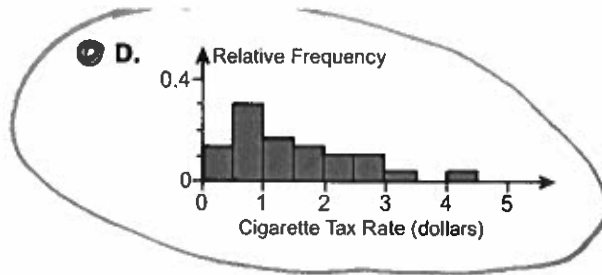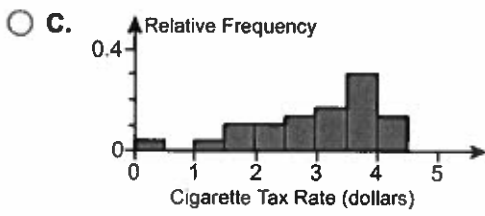$1/30 = 0.03333$
$0/30 = 0.00$
$1/30 = 0.03333$.

(c) Construct a frequency histogram. Choose the correct graph below.

● A.   ○ B.

○ C.   ○ D.

(d) Construct a relative frequency histogram. Choose the correct graph below.

○ A.   ○ B.

C.
Relative Frequency
0.4

Cigarette Tax Rate (dollars)

D.
Relative Frequency
0.4

Cigarette Tax Rate (dollars)

(e) Describe the shape of the distribution.

The distribution is (1) _Skewed right._

(f) Repeat parts (a)–(e) using 5 classes. Note: Take min=0 and max=5 to compute the Class With. ; CW=(5−0)/5 = 1

Construct a frequency distribution.
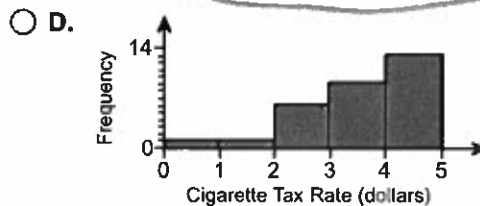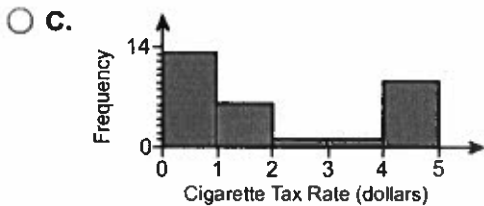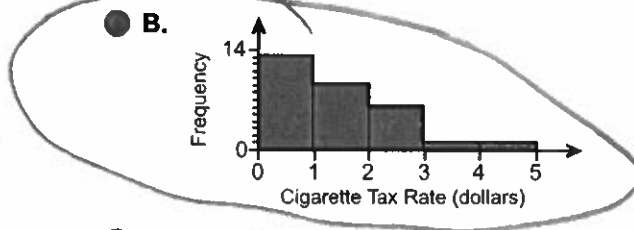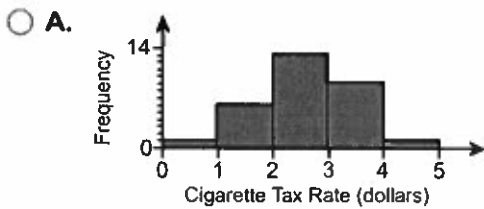(Type integers or decimals. Do not round.)

Tax		Frequency
0 − 0.99		13
1 − 1.99		9
2 − 2.99		6
3 − 3.99		1
4 − 4.99.		1

Construct a relative frequency distribution.
(Round to two decimal places as needed.)

Tax		Relative Frequency
0 − 0.99		0.43
1 − 1.99		0.30
2 − 2.99		0.20
3 − 3.99		0.03
4 − 4.99		0.03

$13/30 = 0.43333$
$9/30 = 0.30$
$6/30 = 0.20$
$1/30 = 0.0333$
$1/30 = 0.0333$

Construct a frequency histogram. Choose the correct frequency histogram below.

A.
14
Frequency

Cigarette Tax Rate (dollars)

B.
14
Frequency

Cigarette Tax Rate (dollars)

C.
14
Frequency

Cigarette Tax Rate (dollars)

D.
14
Frequency

Cigarette Tax Rate (dollars)

Construct a relative frequency histogram. Choose the correct relative frequency histogram below.

A.
Relative Frequency
0.6

Cigarette Tax Rate (dollars)

B.
Relative Frequency
0.6

Cigarette Tax Rate (dollars)
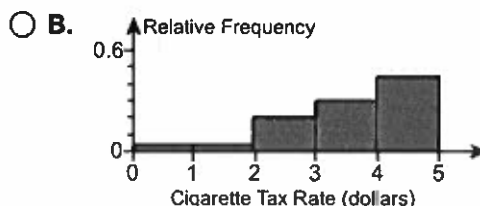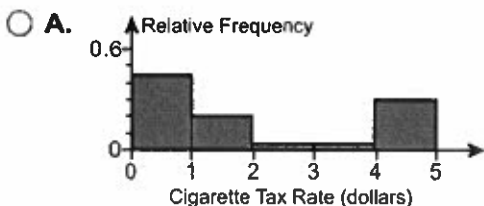
C.

D.
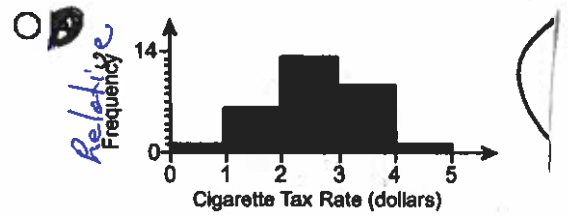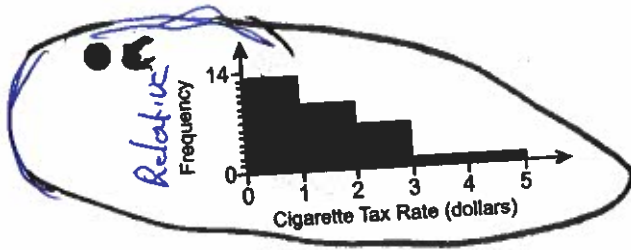
Describe the shape of the distribution.

The distribution is (2) **Skewed Right.**

(g) Does one frequency distribution provide a better summary of the data than the other? Explain.

- ○ **A.** The shape is not clear in the distribution with more classes, so fewer classes should be used.
- ○ **B.** The shape is not clear in the distribution with fewer classes, so more classes should be used.
- ○ **C.** Neither distribution seems to show the shape of the data well. A different class size should be used.
- ● **D.** Both distributions have a similar shape, so either works well.

2: Taxes on a pack of cigarettes (in dollars)

2.84	0.62	1.19	1.04	2.13	0.42
0.78	2.59	0.27	0.35	0.79	0.83
1.54	3.41	0.88	4.21	2.22	2.21
1.64	1.55	1.49	1.68	1.26	0.67
0.17	1.44	2.96	0.69	0.63	0.96

(1) ● skewed right. (2) ○ bell-shaped.
  ○ uniform.   ○ skewed left.
  ○ bell-shaped.   ● skewed right.
  ○ skewed left.   ○ uniform.

1. 0.279

   0.271

   0.202

   0.170

   0.078

   0.202

B.

B.

A.

---

2. 0.169

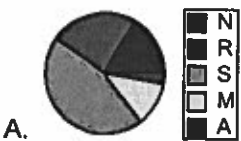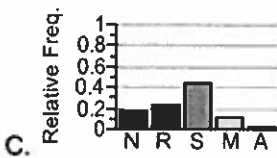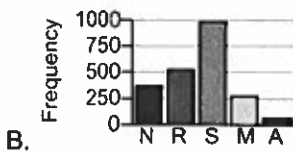   0.236
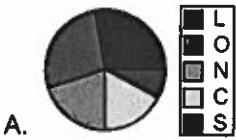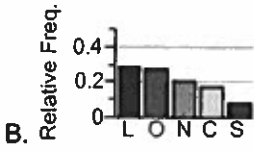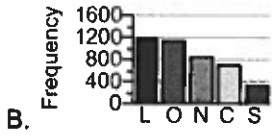
   0.448

   0.121

   0.028

   2.8

   40.3

B.

C.

A.

inferential

3. C.

The statement is true. Any correctly constructed frequency distribution is valid. However, some choices for the categories or classes give more information about the shape of the distribution.

---

4. False

---

5. False

---

6. 9

2

20

2

20

Skewed left

---

7. 200

10

A. 60-69, 2; 70-79, 2; 80-89, 12; 90-99, 44; 100-109, 56; 110-119, 42; 120-129, 31; 130-139, 8; 140-149, 2; 150-159, 1

D. 100-109

D. 150-159

21

D. No, because there are no bars, or frequencies, greater than an IQ of 160.

8. C. The given data are discrete because they can only have whole number values.

2

15

12

7

3

1

0.050

0.375

0.300

0.175

0.075

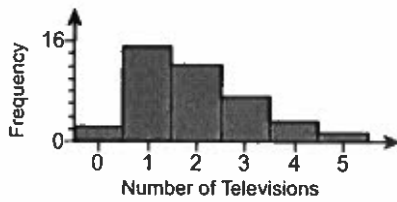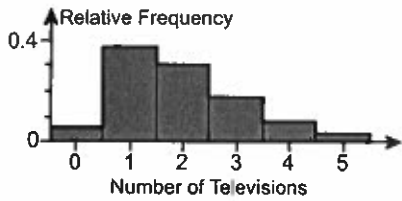0.025

17.5

10

D.

A.

(1) skewed right.

9. (1) 100,

   (2) 100.

   4

   0

   16

   0

   8

   0

   9

   0

   5

   0

   7

   1

   1

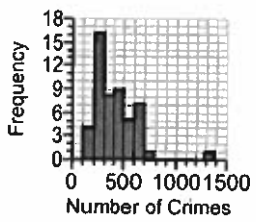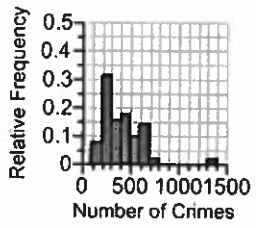   0.078

   0.000

   0.314

   0.000

   0.157

   0.000

   0.176

   0.000

   0.098

   0.000

   0.137

   0.020

   0.020

D.

A.

A. The distribution is skewed right because the right tail is longer than the left tail.

10. 0

0.49

4

0.5

0.99

9

1

1.49

5

1.5

1.99

4

2

2.49

3

2.5

2.99

3

3

3.49

1

3.5

3.99

0

4

4.49

1

0

0.49

0.13

0.5
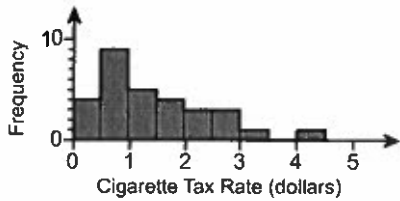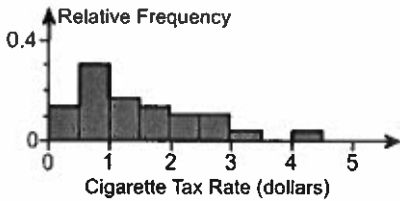
0.99

0.30

1

1.49

0.17

1.5

1.99

0.13

2

2.49

0.10

2.5

2.99

0.10

3

3.49
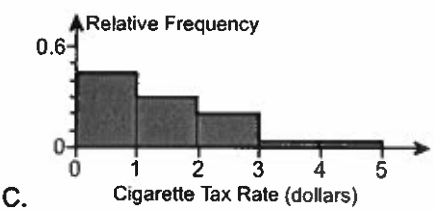
0.03

3.5

3.99

0.00

4

4.49

0.03

A.

Cigarette Tax Rate (dollars)

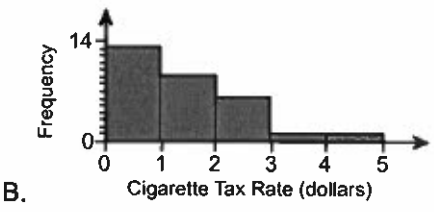D.

Cigarette Tax Rate (dollars)

(1) skewed right.

0.00

0.99

13

1.00

1.99

9

2.00

2.99

6

3.00

3.99

1

4.00

4.99

1

0.00

0.99

0.43

1.00

1.99

0.30

2.00

2.99

0.20

3.00

3.99

0.03

4.00

4.99

0.03

B.

C.

(2) skewed right.

D. Both distributions have a similar shape, so either works well.