Math 1351 Activity 1(Chapter 10)(Due by EOC Feb. 12) Group #_____

1. A business magazine was conducting a study into the amount of travel required for managers across the U.S. Seventy-five managers were surveyed for the number of days they spent traveling each year.

Days Traveling	Frequency	Relative Frequency	Percent Frequency
0 – 6	**15**	**.20**	**20%**
7 – 13	**21**		
14 –20	**27**		
21 –27	**9**		
28 –34	**2**	**.03**	**3%**
35 and above	**1**		
Total	**75**	**1**	**100%**

a) Complete the relative frequency column. *(rounded to 2 decimal places)*
b) Complete the percent frequency column.
c) How many managers traveled for less than two weeks?

d) What percentage of managers traveled for less than two weeks?

e) Exactly how many managers traveled for more than 8 days?

f) Exactly how many managers traveled for more than 20 days?

g) Exactly how many managers traveled for at least 15 days?

h) Exactly how many managers traveled for at most 13 days?

i) What is the largest possible number of managers that traveled for less than 8 days?

2. A nutritionist is interested in knowing the percent of calories from fat which Americans intake on a daily basis. To study this, the nutritionist randomly selects 25 Americans and evaluates the percent of calories from fat consumed in a typical day. The results of the study are as follows:

34% 18% 33% 25% 30% 42% 40% 33% 39% 40% 45% 35% 45%
25% 27% 23% 32% 33% 47% 23% 27% 32% 30% 28% 36%

a) Complete the grouped frequency table for the percent of calories from fat with relative frequencies rounded to 2 decimal places.

Percent of calories from fat	Frequency	Relative Frequency	Percent Frequency
15%-19.9%	**1**	**.04**	**4%**
20%-24.9%			
25%-29.9%			
30%-34.9%			
35%-39.9%			
40%-44.9%			
45%-49.9%			
Total	**25**	**1**	**100%**

b) How many diets had a percent of calories from fat of 25% or more?

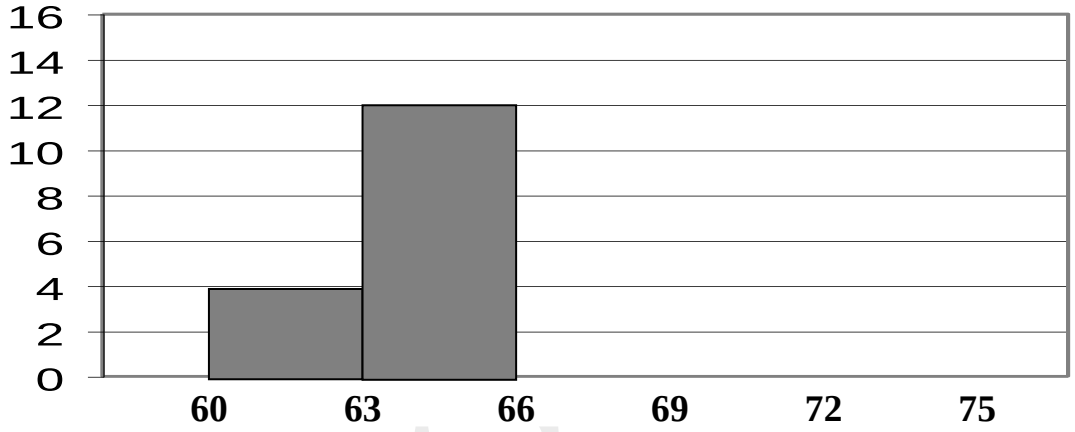
c) How many diets had a percent of calories from fat less than 27%?

d) How many diets had a percent of calories from fat greater than 32%?

e) What percentage of diets had a percent of calories from fat less than 25%?

3. Complete the histogram for the following distribution of heights of fifty students.

Height (in inches)	**Number of students**
60-62	4
63-65	12
66-68	14
69-71	9
72-74	11
Total	50



4. The following 25 values give the percentage recovery of a chemical substance.

57	80	83	66	65	63	74
66	56	67	72	80	70	
65	74	71	72	71	70	
70	73	71	61	78	75	

a) Complete the unordered stem and leaf display.

5	**7**	
6	**6**	**5** **3**
7	**4**	
8	**0**	**3**

b) Are most of the values in the 50's, 60's, 70's, or 80's?

5. The following ordered stem and leaf display gives the pre-weights in pounds of 35 female students participating in a weight loss program.

12	3 8 8
13	1 3 4 4 5 6 8
14	0 0 2 4 5 5 7 7 7 8 9
15	0 1 3 3 5 6 7 8 9 9
16	1 2 2 9

a) What is the lightest weight?

b) What is the heaviest weight?

c) How many weigh 134 pounds?

d) How many weigh 150 pounds?

e) Which weight occurs most often?

f) How many weigh less than 130 pounds?

g) How many weigh less than 110 pounds?

h) How many weigh at least 150 pounds?

i) How many weigh more than 160 pounds?

j) How many weigh more than 170 pounds?

k) Are most of the weights in the 120's, 130's, 140's, 150's, or 160's?

6. Stem-and-leaf plots can also be used to compare data sets. Here is a comparison of test grades in an 8 AM math class and an 11 AM math class.

8 AM class												11 AM class							
										5	1	6	8	9				
											2							
										7	3	0	5	9				
										7	4	1	3	4	6	7	8	8
								4	2	1	5	5	5	5	7	8	8	
				6	5	5	5	4	3	3	6	2	2	4	5	9		
			7	7	6	6	5	4	3	1	7	1	1	5				
9	9	8	8	8	7	7	3	2	2	0	8	0	3					
				6	5	4	2	1	0	0	9							

a) How many students scored in the 90's in the 8 AM class?

b) How many students scored in the 90's in the 11 AM class?

c) Which class did better on the test? Explain.

7. The age of child occupants in car accidents is given in the following frequency distribution.

Age(years)	Frequency
1	698
2	747
3	594
4	538
5	513
Total	3090

a) Determine the mean age of child occupants in car accidents.

(Show your calculation, and round to the tenths place.)

b) Determine the median age of child occupants in car accidents.

(Show your calculation.)

c) Determine the modal age of child occupants in car accidents.

8.

Directions: For each set of numbers find the mean, the mode, and the median, in that order. Be sure to look for the letters in the boxes below and round each answer to the nearest tenth if needed. To find the solution, read (horizontally) across the mean, mode, and median columns from 1–14.

Question: What did the veterinarian say when the woman brought in her dog who had swallowed a roll of film? ***Write the answer at the bottom of the page!***

Numbers	Mean	Mode	Median
1. 78, 72, 65, 65, 70			
2. 53, 14, 14, 27, 67, 42, 14			
3. 85, 90, 90, 95			
4. 3, 15, 27, 90, 90			
5. 14, 90, 90, 90, 16, 14, 6, 8			
6. 49, 52, 65, 65, 76, 84			
7. 15, 15, 14, 14, 13, 17, 16			
8. 15, 18, 19, 16, 19, 15, 15, 20, 16			
9. 10, 8, 14, 14, 31, 41, 53, 65, 61			
10. 14.8, 19.2, 18.7, 15.8, 13			
11. 16.9, 16, 14.1, 9.2, 9.2, 17.8, 19			
12. 33.1, 34.9, 30, 32, 33, 34, 34			
13. 15, 17, 20, 24, 25, 10, 10, 10			
14. 17, 19, 18, 16, 15, 14, 20, 14, 20			

Mean Box

A = 16.3	I = 70
E = 16.4	K = 45
N = 50.75	L = 65.2
O = 17	N = 33
T = 14.6	V = 14.9
H = 90	W = 41

Mode Box

G = 34	P = 15
H = 9.2	R = 10
D = 65	T = 14
E = 14, 15	U = 14, 20
I = 90	N = none

Median Box

S = 17	L = 15
S = 33.1	N = 90
E = 65	O = 31
I = 16	T = 27
O = 70	Y = 15.8

9. The maximum heart rates after exercise for 9 people are recorded below.

a) Complete the following table.

Heart rate	$\bar{x}$	$x_i - \bar{x}$	$\left(x_i - \bar{x}\right)^2$
126	**154**	**-28**	**784**
130	**154**	**-24**	**576**
145	**154**		
150	**154**		
155	**154**		
160	**154**		
165	**154**		
170	**154**	**16**	**256**
185	**154**	**31**	**961**
Total		**0**	

b) Find the population variance using the formula, $\sigma^2 = \dfrac{\sum\left(x_i - \bar{x}\right)^2}{n}$.

c) Find the population standard deviation from the variance.

(Round to the hundredths place.)

d) Find the range.

e) According to Chebyshev's Inequality, at least 75% of the values lie within 2 standard deviations from the mean, 154. What is the actual percentage for this data set?

10. The following ordered stem and leaf display gives the pre-weights in pounds of 35 female students participating in a weight loss program.

12	3 8 8
13	1 3 4 4 5 6 8
14	0 0 2 4 5 5 7 7 7 8 9
15	0 1 3 3 5 6 7 8 9 9
16	1 2 2 9

a) What is the mean weight? ***(Round to the tenths place if necessary.)***

b) What is the median weight?

(Show your calculation.)

c) What is the modal weight?

11.

Directions: Arrange the test scores below in a stem and leaf plot from least to greatest. After organizing all of the data in the plot, count the number of leaves per stem. Then look below the chart to find the letter which corresponds to the number of leaves. Find the answer to the following question by writing the correct letter on the appropriate line.

Question: Where do Australian children go to play?

Write the answer at the bottom of the page!

Test Scores: 96, 81, 79, 79, 100, 100, 93, 87, 62, 67, 91, 80, 91, 83, 47, 98, 93, 88, 88, 70, 75, 63, 63, 100, 57, 58, 96, 74

Stems	Leaves

Number of leaves	Letter

Letters

A=6	D=8	G=11	K=3	U=2
B=5	E=9	H=12	O=1	T=4
C=7	F=10	I=13		

12. For the data set: $\{1,1,3,39\}$,

a) Determine the mean.

b) Determine the median.

If the extreme value of 39 is changed to 7, leading to the new data set: $\{1,1,3,7\}$**,**

c) Determine the new mean.

d) Determine the new median.

e) Which measure of central tendency was more resistant to the change in the extreme value in this situation?

13. For the data set: $\{1,1,1,7,7,19\}$,

a) Determine the median.

b) Determine the mode.

If one of the extreme values of 1 is changed to 0, and the extreme value of 19 is changed to 7, leading to the new data set: $\{0,1,1,7,7,7\}$**,**

c) Determine the new median.

d) Determine the new mode.

e) Which measure of central tendency was more resistant to the change in the extreme values in this situation?

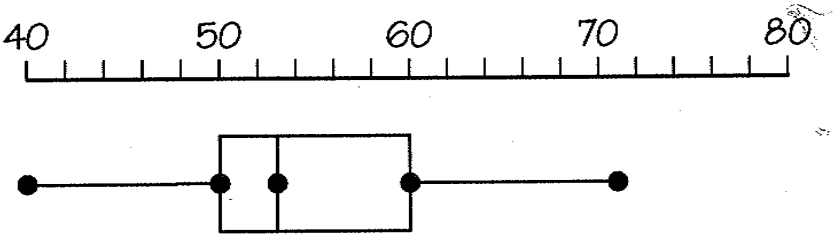
14. According to Chebyshev's Inequality, at least 36% of the values in a data set must lie within 1.25 standard deviations from the mean. The percentage from the inequality is usually smaller than the actual percentage for the data set. Determine the exact percentage of values that lie within 1.25 standard deviations from the mean for the following data sets.

a) $\{1,2,3,4,5,6,7,8,19,20\}$, $\bar{x} = 7.5$, $\sigma = 6.34$

b) $\{4,5,15,16,17,18,19,20,33,40\}$, $\bar{x} = 18.7$, $\sigma = 10.43$

15. Ages of U.S. Vice-Presidents

The following box plot shows the ages of the 20 twentieth-century vice-presidents at their inaugurations.



Use the box plot above to answer the following.

The youngest vice-president was Richard Nixon. How old was he at his inauguration?

The oldest vice-president at inauguration was Alben William Barkley (Truman's V.P.) How old was he at his inauguration?

What was the median age at inauguration?

What percentage of the vice-presidents were over 60 (the upper quartile)?

What percentage of the vice-presidents were younger than 50 (the lower quartile)?

Al Gore was 44 at his inauguration. Complete this sentence: There were at least _____ vice-presidents who were older at the time of their inaugurations.

16. Some information is lost when the data is converted into a boxplot. Use the actual ages of the Vice-Presidents to answer the following questions:

Vice-President	Age at inauguration
Charles Fairbanks	52
James Sherman	53
Thomas Marshall	58
Calvin Coolidge	48
Charles Dawes	59
Charles Curtis	69
John Garner	64
Henry Wallace	52
Harry Truman	60
Alben Barkley	71
Richard Nixon	40
Lyndon Johnson	52
Hubert Humphrey	53
Spiro Agnew	50
Gerald Ford	60
Nelson Rockefeller	66
Walter Mondale	49
George Bush	56
Dan Quayle	41
Al Gore	44

a) What percentage of the vice-presidents were over 60 (the upper quartile)?

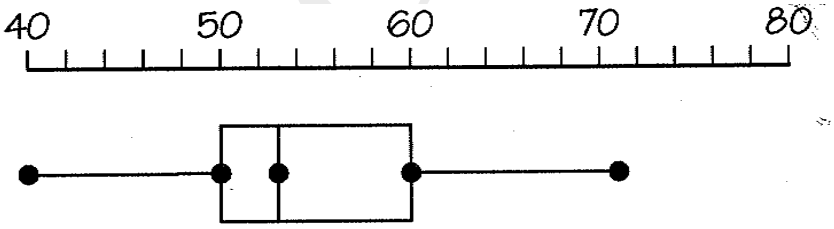
b) What percentage of the vice-presidents were younger than 50 (the lower quartile)?

c) How many vice-presidents were older at the time of their inauguration than Al Gore was at his inauguration?

17. There are 17 twentieth century Presidents:

President	Age at inauguration
T. Roosevelt	42
Taft	51
Wilson	56
Harding	55
Coolidge	51
Hoover	54
F. Roosevelt	51
Truman	60
Eisenhower	62
Kennedy	43
Johnson	55
Nixon	56
Ford	61
Carter	52
Reagan	69
Bush	64
Clinton	46

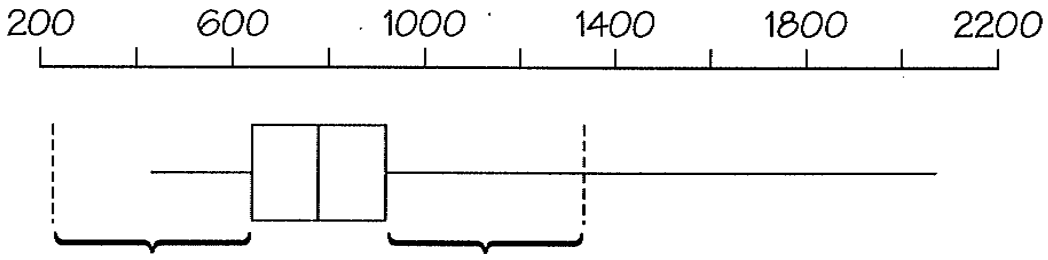
a) Make a combined boxplot of the ages of the Presidents with the boxplot of the Vice-Presidents given below. Draw the boxplot for the Presidents under the boxplot of the Vice-Presidents using the same scale.



b) Which group is older, Presidents or Vice-Presidents? Explain.

c) Which group has more variability in ages, Presidents or Vice-Presidents? Explain.

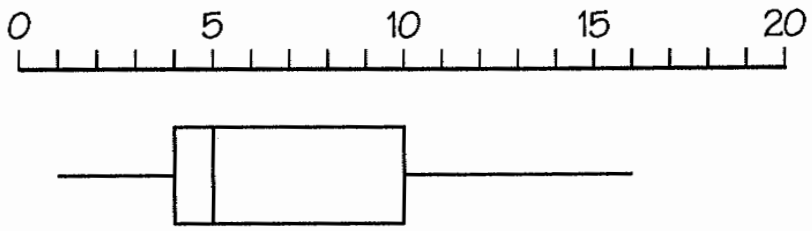
18. A box plot gives an easy way to estimate whether or not the data set contains any outliers. To estimate if there are any outliers, visually add one-and-a-half box lengths to each end of the box. Any data values beyond those lengths are outliers, so if either of the whiskers extends beyond those lengths, the data set contains outliers. As an example:



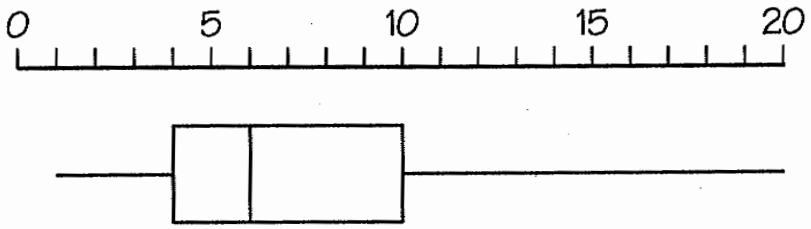
Since the upper whisker goes beyond one-and-a-half box lengths above the upper end of the box, there is at least one outlier in that whisker.

Use this method to estimate whether or not there are any outliers in the following data sets represented by the given box plots. Also, indicate if the outliers are in the lower whisker or upper whisker.

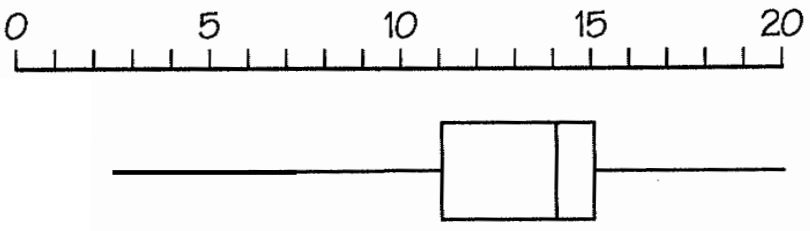
a)



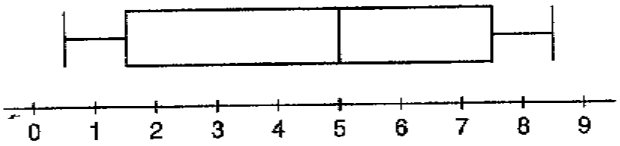
b)



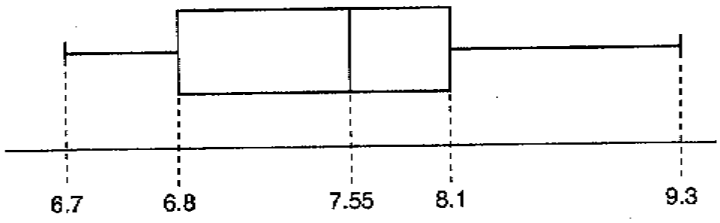
c)



19. What is the median of the data set that is represented by the following box-and-whisker plot?



20. A data set is represented by the following box-and-whisker plot.



a) What is the range of the data set?

b) What is the interquartile range(IQR) of the data set?

21. The first quartile, Q_1, has the property that approximately 25% of the values in the data set are less than or equal to it, and approximately 75% of the values are greater than or equal to it. The second quartile, Q_2, otherwise known as the median, has the property that approximately 50% of the values in the data set are less than or equal to it, and approximately 50% of the values are greater than or equal to it. The third quartile, Q_3, has the property that approximately 75% of the data values are less than or equal to it, and approximately 25% of the values are greater than or equal to it. Sometimes the approximations might be pretty rough.

a) For the data set $\{1,2,3,4,5\}$,

What percentage of the values are less than or equal to Q_1?

What percentage of the values are greater than or equal to Q_1?

b) For the data set $\{1,1,1,4,5,6\}$,

What percentage of the values are less than or equal to Q_3?

What percentage of the values are greater than or equal to Q_3?

c) For the data set $\{1,1,1,1,1,1,1\}$,

What percentage of the values are less than or equal to Q_2?

What percentage of the values are greater than or equal to Q_2?

d) For the data set $\{1,2,3,4,5,6,7,8\}$,

What percentage of the values are less than or equal to Q_1?

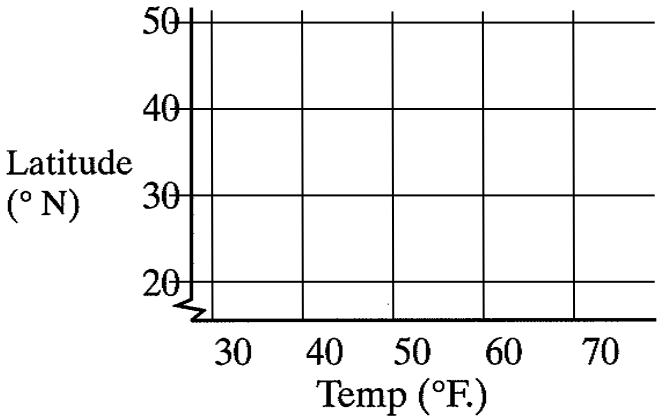
What percentage of the values are greater than or equal to Q_2?

What percentage of the values are greater than or equal to Q_3?

22. In this activity, you will make scatter plots using some climatological data from U.S. cities. The table below gives the average temperature and average precipitation in the month of March for various U.S. cities, together with the latitude of those cities.

City	Av. March Temp (°F)	Av. March Precip. (in.)	Latitude (°N)
Atlanta, GA	53	5.9	34
Boston, MA	38	4.1	42
Buffalo, NY	33	3.0	43
Dallas, TX	56	2.4	33
Houston, TX	61	2.7	30
Kansas City, MO	42	2.1	39
Lexington, KY	44	4.8	38
Los Angeles, CA	60	2.4	34
Miami, FL	72	1.9	26
Nashville, TN	49	5.6	36

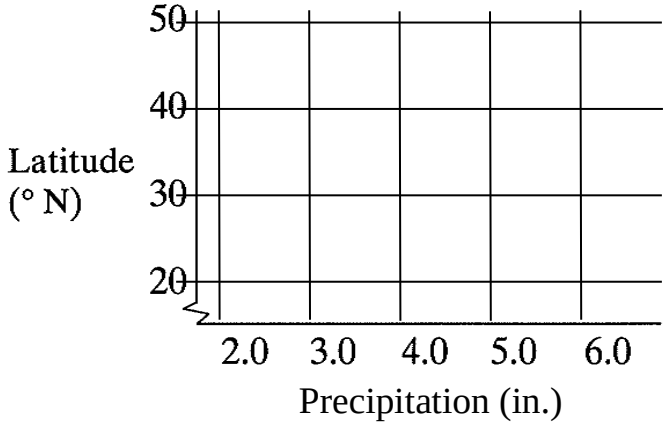
a) Make a scatter plot of temperature against latitude, using the data from the table.



b) Is there a correlation between temperature and latitude? _____

If so, is it positive? _____

c) On the axes below, make a scatter plot of precipitation against latitude, using the data above.



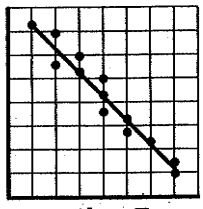
d) Is there a correlation between precipitation and latitude? _____

If so, is it positive? _____

23.

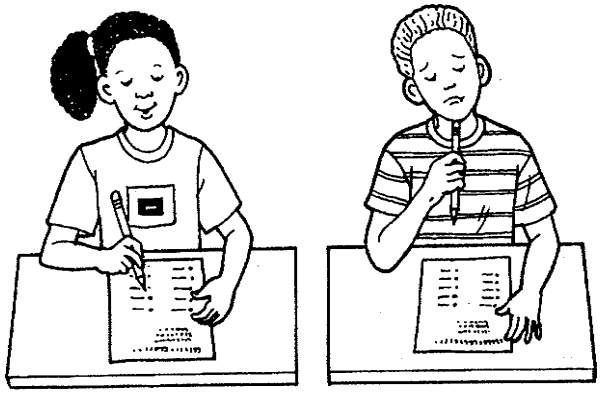
Quick Review

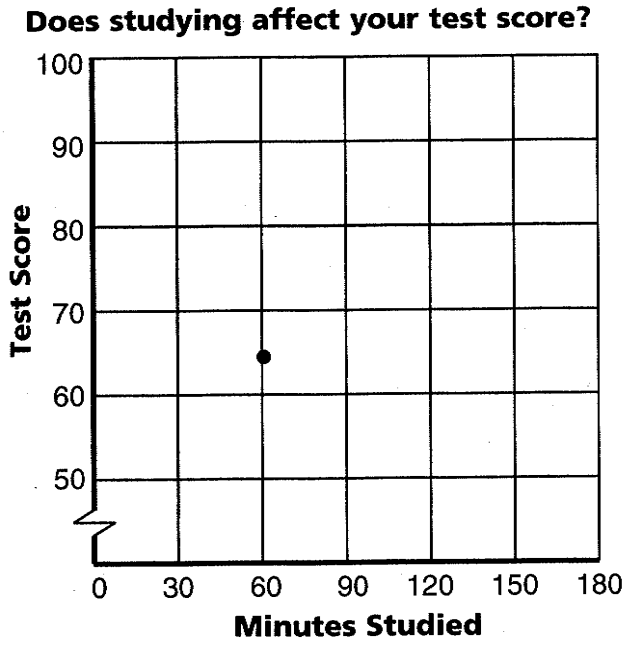
1. If the points in a scatterplot form a pattern, you can draw a straight line that approximates their position. The line is called a *trend line* or *line of best fit.*
2. A *positive trend line* goes up. A *negative trend line* goes down. If the points do not form a pattern, there is *no trend.*



Negative Trend

A. Plot the data from the table below that lists the amount of time students studied and the scores they earned on a test. A sample point has been done for you. Look for a pattern among the points on the graph. Draw the trend line.





Minutes Studied	60	30	180	90	60	0	120	180	60	150	30	120	75	90
Test Score	65	60	95	70	72	50	84	100	68	96	100	90	70	80

B. Label each statement as True or False. If a statement is false, cross out the letter next to the answer blank. Find the missing word below by writing the uncrossed letters in order.

G _____ **1.** In general, the more time studied the better the test score.

R _____ **2.** One student scored high even though he or she didn't study much.

E _____ **3.** Several students who studied for three hours scored low.

A _____ **4.** The scatterplot in problem A shows a positive trend.

T _____ **5.** The scatterplot in problem A shows a negative trend.

M _____ **6.** The trend line does not pass through every point.

A SCATTERPLOT IS ALSO CALLED A "SCATTER _____."

24. A method of finding a line that fits a scatterplot is called the Wald Method. Here's how it works: Suppose that you have an even number of ordered pairs $(x_1, y_1), (x_2, y_2), \ldots, (x_{2n}, y_{2n})$ where n is a positive integer and the **<u>x-coordinates are in ascending order</u>** $x_1 \le x_2 \le \cdots \le x_{2n}$ (If there are an odd number of data points, then disregard the one in the middle.)

1. Find the average ordered pair for the first half of the data points $P' = (x', y')$ with $x' = \dfrac{x_1 + x_2 + \cdots + x_n}{n}$ and $y' = \dfrac{y_1 + y_2 + \cdots + y_n}{n}$.

2. Find the average ordered pair for the second half of the data points $P'' = (x'', y'')$ with $x'' = \dfrac{x_{n+1} + x_{n+2} + \cdots + x_{2n}}{n}$ and $y'' = \dfrac{y_{n+1} + y_{n+2} + \cdots + y_{2n}}{n}$.

3. Determine the slope of the line through the two points P' and P'': $m = \dfrac{y'' - y'}{x'' - x'}$.

4. Use the Point-slope formula from Algebra to find the Wald function: $w(x) = m(x - x') + y'$

Example: For the data set

x	*y*
12	258
15	266
27	191
51	133
67	107
78	81
85	44
92	43
88	52
61	120
49	142
39	188

The first half of the values are

$(12,258), (15,266), (27,191), (39,188), (49,142), (51,133)$, and the second half of the values are

$(61,120), (67,107), (78,81), (85,44), (88,52), (92,43)$. Now let's find the two average points:

$x' = \dfrac{12+15+27+39+49+51}{6} = 32.2$ and $y' = \dfrac{258+266+191+188+142+133}{6} = 196$

$x'' = \dfrac{61+67+78+85+88+92}{6} = 78.5$ and $y'' = \dfrac{120+107+81+44+52+43}{6} = 74.5$. Now let's find the slope of the Wald line: $m = \dfrac{74.5-196}{78.5-32.2} = \dfrac{-121.5}{46.3} = -2.62$. So the Wald function is given by $w(x) = -2.62(x-32.2)+196$.

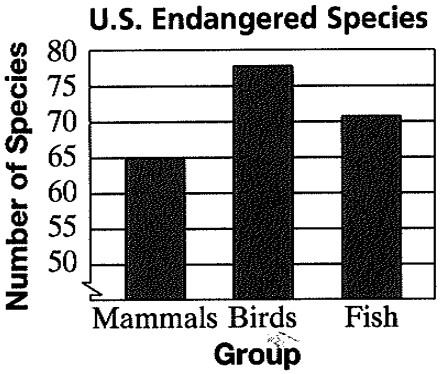
a) Determine the Wald function for the following data set:***(Round the slope to two places.)***

x	***y***
13.2	31.4
10.5	27.0
17.7	38.8
21.3	47.5
22.4	52.1
11.9	27.6
18.8	39.9
25.0	53.7

b) Use the Wald function to predict *y*-values for the given *x*-values: ***(Round to one place.)***

x	***y***
9.1	
12.4	
20.5	
26.2	

25.



a) Which group of animals appears to have about twice as many endangered species as mammals?

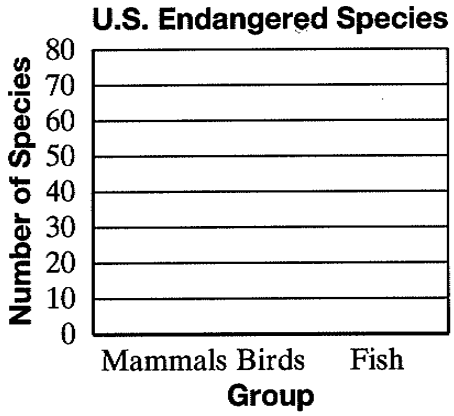
_____

b) Does one group actually have twice as many endangered species as mammals?

_____

c) What gives the impression that one group has twice as many endangered species as mammals?

_____



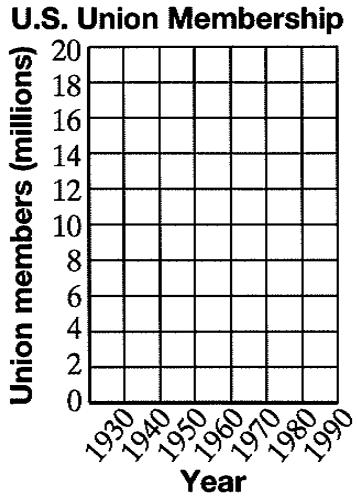
d) Redraw the graph without a break.

e) Describe the effect the change in scale has on what the graph suggests.

_____

U.S. Union Membership							
Year	1930	1940	1950	1960	1970	1980	1990
Union members (millions)	3	9	14	17	19	20	17

f) Draw a line graph of the data using the grid below.



g) Draw a line graph of the data using the grid below.

h) What gives the different impressions in the two graphs?

_____

26.

The Young Vampire

Directions: Arrange the following data (test scores) in the Frequency Table. Notice the frequency for each number, and find its corresponding letter in the Letter Bin. Write the letters in the letter column to find the first part of the answer to the riddle.

Question: Who did the vampire play with when he was younger?

Write the complete answer at the bottom of the page.

Frequency Table			
Scores	**Tally**	**Frequency**	**Letter**
65			
68			
69			
78			
79			
85			
87			
88			
89			
90			
95			
97			
98			

Test Scores: 85, 85, 85, 85, 85, 79, 79, 79, 79, 87, 90, 90, 78, 78, 68, 69, 69, 85, 69, 68, 98, 90, 69, 68, 78, 68, 87, 97, 79, 69, 98, 90, 89, 89, 89, 97, 97, 68, 78, 78, 85, 69, 85, 65, 68, 68, 69, 87, 90, 85, 90, 88, 69, 88, 69, 78, 87, 97, 78, 90, 78, 90, 90, 79, 85, 97, 69, 90

Letter Bin

T = 1 **S** = 2
N = 3 **L** = 4
K = 5 **I** = 6
H = 7 **G** = 8
E = 10 **R** = 10
C = 0

Using the same data, complete the chart below. Circle the letter that each number group reaches to find the last word of the riddle.

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
60–69				X				J			G			P				D		
70–79			W			A				E				O	C		B			
80–89							Q			Z			F		Y				O	
90–99		M		N					H			L				K	R			

Write the complete answer to the question here:

Charlie Brown ran an experiment to determine how the water temperature effects the length of frog legs. He used 44 frogs of the same type and age in his experiment. The results were as follows:

Experiment A:
For eleven frogs raised at 8° C, he recorded the following lengths in centimeters: 4.2, 3.8, 5.7, 4.2, 4.0, 4.2, 3.7, 4.2, 3.0, 2.9, 2.5.

Experiment B:
For eleven frogs raised at 13° C, he recorded: 6.0, 3.7, 5.2, 6.0, 5.0, 4.9, 6.0, 5.3, 5.5, 3.8, 5.9.

Experiment C:
For eleven frogs raised at 18° C, he recorded: 9.5, 8.6, 8.3, 2.0, 2.7, 5.0, 9.4, 8.6, 8.4, 6.0, 5.5.

Experiment D:
For eleven frogs raised at 14° C, he recorded: 5.7, 4.9, 4.4, 5.5, 4.1, 5.3, 4.4, 4.3, 4.6, 5.1, 4.5.

1. Answer the following for experiment A:
   a. The mean is _____.
   b. The median is _____.
   c. The mode is _____.
   d. If Charlie wants to pick only one of the above measures of central tendency that best describes the "average" length of frog legs raised at 8° C, which one would he pick? Why?

   e. If you were going to buy frog legs from Charlie at $.50 per cm for "average" length, which "average" would you pick? Why?

   f. If you were Charlie selling the frog legs, which measure would you advertise as the "average" length of the frog legs? Why?

2. Answer the following for experiment B:
   a. The mean is _____.
   b. The median is _____.
   c. The mode is _____.
   d. Would the mode be a good measure for Charlie to use to best represent the length of frog legs raised at 13° C? Why or why not?

3. Answer the following for experiment C:
   a. The mean is _____.
   b. The median is _____.
   c. The mode is _____.
   d. Now, if Charlie wants to pick only one of the above measures that best describes the length of frog legs at 18° C, which one would he pick? Why?

   e. If you were Charlie, would you run this experiment again with 11 new frogs? Why or why not?

4 Answer the following for experiment D:
   a. The mean is _____.
   b. The median is _____.
   c. The mode is _____.
   d. If Charlie wants to pick only one of the above measures that best describes the length of frog legs at 14° C, which one would he pick? Why?

5. Look at the data for all four experiments. In which one did Charlie obtain the best results (i.e., most consistent set of data)? Why?

I scored these points in 8 basketball games: 20, 20, 16, 21, 15, 20, 14, 10. range = _____ mean = _____ median = _____ mode = _____	I earned these amounts: \$2.50, \$3.75, \$6.20, \$3.75, \$8.00, \$5.75. How much greater is the mean than the mode?	I worked these hours in 1 week: 8, $6\frac{1}{2}$, 5, 8, $5\frac{1}{2}$, 7, $7\frac{1}{2}$, 8. Which is greatest, the mean, mode, or median?
Five baseball players hit these many home runs in a season: 36, 25, 45, 23, 8. What is the median for these data?	What 4 numbers have a range of 4, a median of 22, a mean of 22, and a mode of 22?	Is there a mode in this data: 3, 4, 5, 6, 7, 8?
Students received these test scores: 96%, 88%, 52%, 75%, 82%, 91%, 75%. What is the mean?	These numbers were on a lottery ticket: 18, 33, 42, 17, 26. What is the range?	I have 5 numbers. The mean for these numbers is 12. What is the sum of the numbers?

In 2003, Sonya Thomas set a stomach-popping world record by eating 65 boiled eggs in 6 minutes and 40 seconds! To burn off that 5,000-calorie meal, Sonya probably needed to do a little exercise. Look at the pictograph to find out just how much exercise time that would take. Then answer the questions.

Exercise Time Needed to Burn 5,000 Calories

Bicycling	
In-line skating	
Jumping rope	
Running	
Swimming	
Step aerobics	

KEY: = 1 hour of exercise

1. Which exercise burns calories the fastest? _____

2. Which exercise would Sonya have to do for the longest time to burn off 5,000 calories? _____

3. Which two exercises burn calories at the same rate? _____

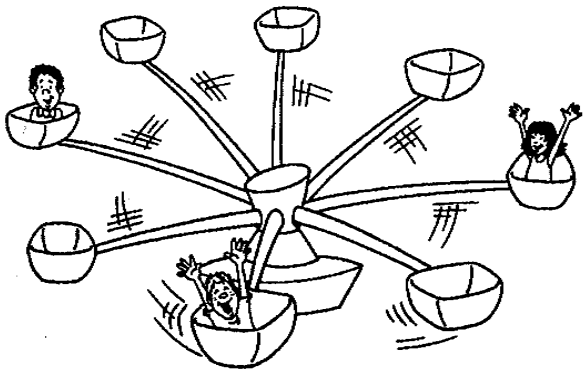
4. To burn off 5,000 calories, how long would Sonya have to swim? _____

5. Which exercise takes about 13 hours to burn 5,000 calories? _____

Mr. Carney owns an amusement park with several spine-tingling rides. Last summer he conducted a two-week study to see how many people rode each ride. Take a glimpse at the results shown in the stem-and-leaf diagrams below. Then answer the questions.

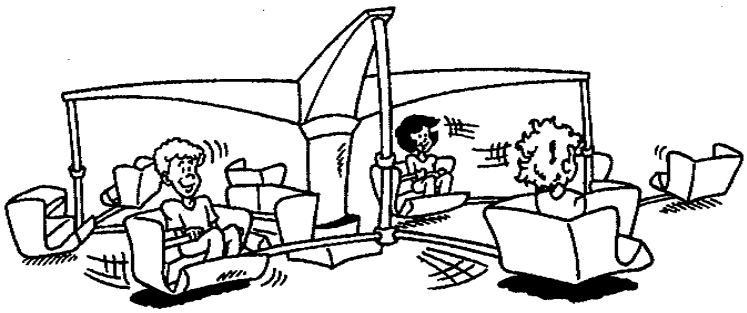
Octopus

Stem	Leaf
9	0 1 3
10	1 2 2 4
11	5 7 7 9
12	0 0 6



Scrambler

Stem	Leaf
7	0 0 0 2
8	0 4 5 5 6
9	3 7 8
10	2 5

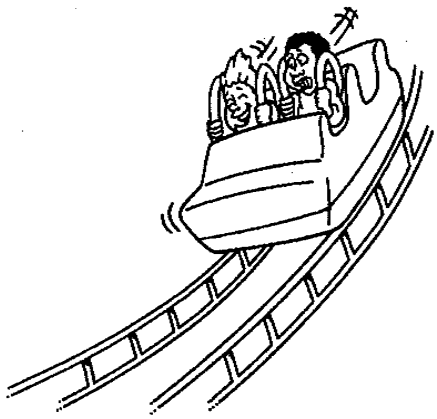


Merry-Go-Round

Stem	Leaf
0	3 5
1	1 2 4 5
2	0 1 3
3	1 8
4	2 3 6

Roller Coaster

Stem	Leaf
15	0 1 3
16	4 4 8
17	6 7 7 9
18	3 5 5 6



1. What was the greatest number of people who rode the Octopus in one day? _____

2. Which ride had the fewest total riders? _____

3. What was the greatest number of people who rode the Scrambler in one day? _____

4. What was the most common number of riders per day on the Scrambler? _____

5. Which ride clearly had the most riders? _____

6. How many riders went on the merry-go-round on that ride's busiest day? _____

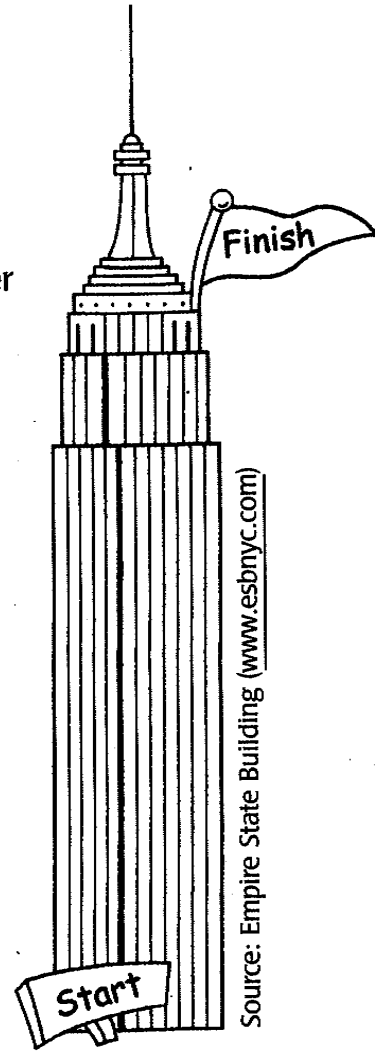
7. What was the smallest number of riders on the roller coaster in one day? _____

8. On how many days did more than 160 people ride the roller coaster? _____

9. On how many days did fewer than 100 people ride the Scrambler? _____

10. Which ride had the most days with 30 or fewer riders? _____

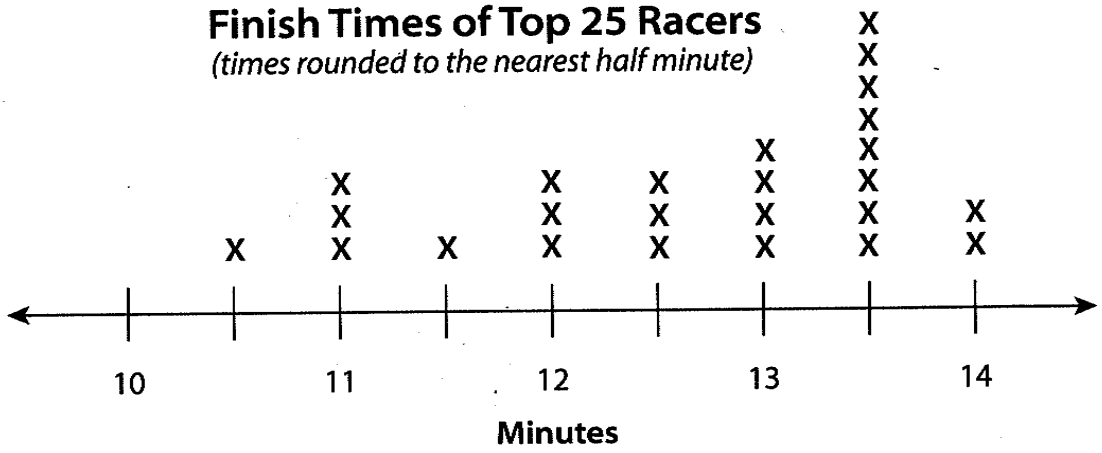
The Empire State Building Run-Up may just be the world's wackiest race. Each year, racers of all ages scramble up 1,576 steps to the Observatory deck on the 86th floor of the famous New York skyscraper. Look at the line plot to see how quickly the nimblest racers reach the top. Then answer the questions.



Source: Empire State Building (www.esbnyc.com)

2004 Empire State Building Run-Up: Finish Times of Top 25 Racers

(times rounded to the nearest half minute)



1. What was the winner's time for the race? _____

2. How many racers finished in 13 minutes or less? _____

3. What was the most common finish time among the top 25 racers? _____

4. How many racers finished in less than 12 minutes? _____