

Tomorrow

Test on Ch. 4 and Turn in Your notebook
before the test

Today & Thursday

Basic Statistics

Friday

Final Exam Review
and Turn-in last HW Packet

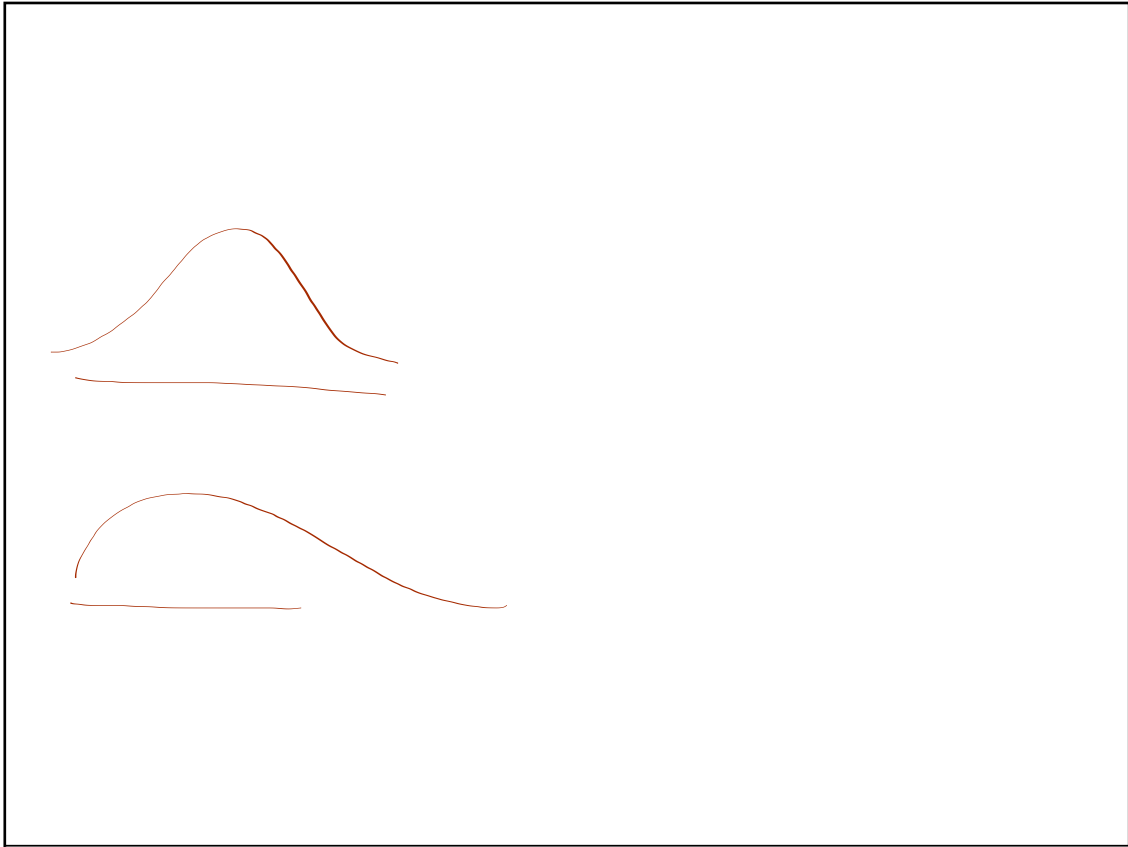
1. Calculate the numerical average (the mean) of the following weights (in kg)

97 108 95 95 101 123 96

$$\text{mean} = \bar{x} = \frac{97 + 108 + 95 + 95 + 101 + 123 + 96}{7}$$

$\sum x_i$ n

$$= \frac{715}{7} \approx 102.1 \text{ kg}$$



2. Now determine the median (middle location assuming data is arranged from smallest to largest).
3. Now re-calculate the median if 100 kg is added to the data set.

2. Now determine the median (middle location assuming data is arranged from smallest to largest).

$$95 \quad 95 \quad 96 \quad 97 \quad 101 \quad 108 \quad 123 \quad \text{med.} = 97 \text{ kg}$$

↑

3. Now re-calculate the median if 100 kg is added to the data set.

$$95 \quad 95 \quad 96 \quad 97 \quad 100 \quad 101 \quad 108 \quad 123$$

↑

$$\text{median} = \frac{97 + 100}{2} = 98.5 \text{ kg}$$

4. Some symbols in statistics

Sigma →

 Σ

Summation

 \bar{x}

mean (of sample)

$$\bar{x} = \frac{\sum x_i}{n}$$

n

frequency

5. Follow the instructions on the "Calculator Basics" handout to calculate the mean of the three scores:

110 120 130

$$\bar{X} = \frac{\sum x_i}{n} = \frac{360}{3} = 120$$

\uparrow formula \uparrow answer

6. Weighted Mean

<u>Points</u>	<u>frequency</u>
110	72
120	30
130	8

$$\sum f \rightarrow 110$$

$$\begin{aligned} \bar{X} &= \frac{\sum f_i x_i}{\sum f_i} \\ &= \frac{12560}{110} \\ &= 114.2 \text{ marks} \end{aligned}$$

$$\bar{X} = 110 \times 72 + 120 \times 30 + 130 \times 8$$

$x_i \quad f_i \quad x_2 \quad f_2 \quad x_3 \quad f_3$

A boy rolled a die 50 times with the following results:

Score	Frequency
1	9
2	10
3	5
4	8
5	7
6	11

60

Calculate the mean score, showing the appropriate formula and critical values

$$\bar{x} = \frac{\sum f \cdot x_i}{\sum f} = \frac{227}{60} = 3.78$$

A boy rolled a die 50 times with the following results:

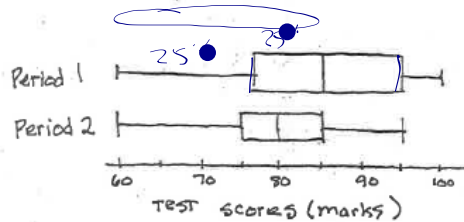
Score	Frequency
1	9
2	10
3	5
4	8
5	7
6	11

Calculate the mean score, showing the appropriate formula and critical values

$$\bar{x} = \frac{\sum fx}{n} = \frac{177}{50} = 3.54$$

II Five Number Summaries and Box Plots

- ① Look at the two boxplots of test scores of two classes.



What is the median test score in period 1? 85 marks

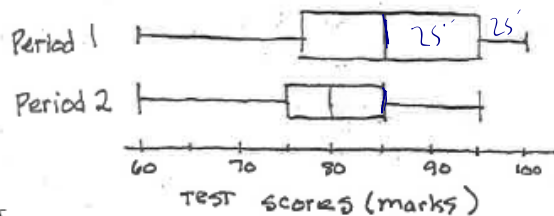
What is ^{the} Period 1 mean score? No idea

What is the range of test scores in period 1? 40 marks

What is the IQR (interquartile range)?

of Period 1 20

of Period 2 10



Can you determine the number of test takers in either Period? NO

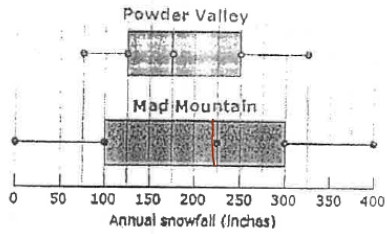
What percentage of the class in Period 1 is above 85 marks? 50%

What percentage of the class in Per. 2 is above 85 marks? 25%

What class, in your opinion, had more variation in their scores? P. 1

2

	Min	Q ₁	median	Q ₃	max
Powder Valley	75	125	175	250	325
Mad Mountain	0	100	225	300	400



For Mad Mountain, what percent of its years

had less than 225 inches? 50%

had less than 100 inches? 25%

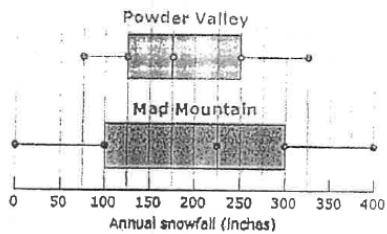
had a snowfall between 100 and 225 inches? 25%

had a snowfall between 100 and 300 inches? 50%

For Mad Mountain, how many years were measured?

2

	Min	Q ₁	median	Q ₃	max
Powder Valley	50	125	175	250	325
Mad Mountain	0	100	225	300	400



For Mad Mountain, what percent of its years

had less than 225 inches? 50%

had less than 100 inches? 25%

had a snowfall between 100 and 225 inches? 35%

had a snowfall between 100 and 300 inches? 50%

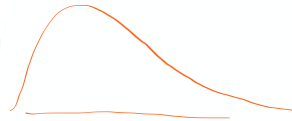
For Mad Mountain, how many years were measured?

??

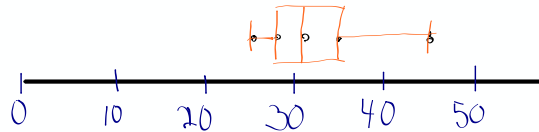
1-variable Statistics - Class Notes - Part 3

1. Draw a box-and-whisker plot for the running times

Minutes to Run 5km				
26	26.1	27.2	27.6	28.9
30.2	30.6	31.1	31.5	32.1
33.4	34	34	34	36.7
45				



min 26
 Q1 28.25
 med 31.3
 Q3 34
 max 45



Describe the distribution of running times.
 (Symmetric, Uniform, skewed left, skewed right)

Skewed to right

2. Calculate the inter-quartile range (IQR)

3. Calculate the mean run time and the median run time

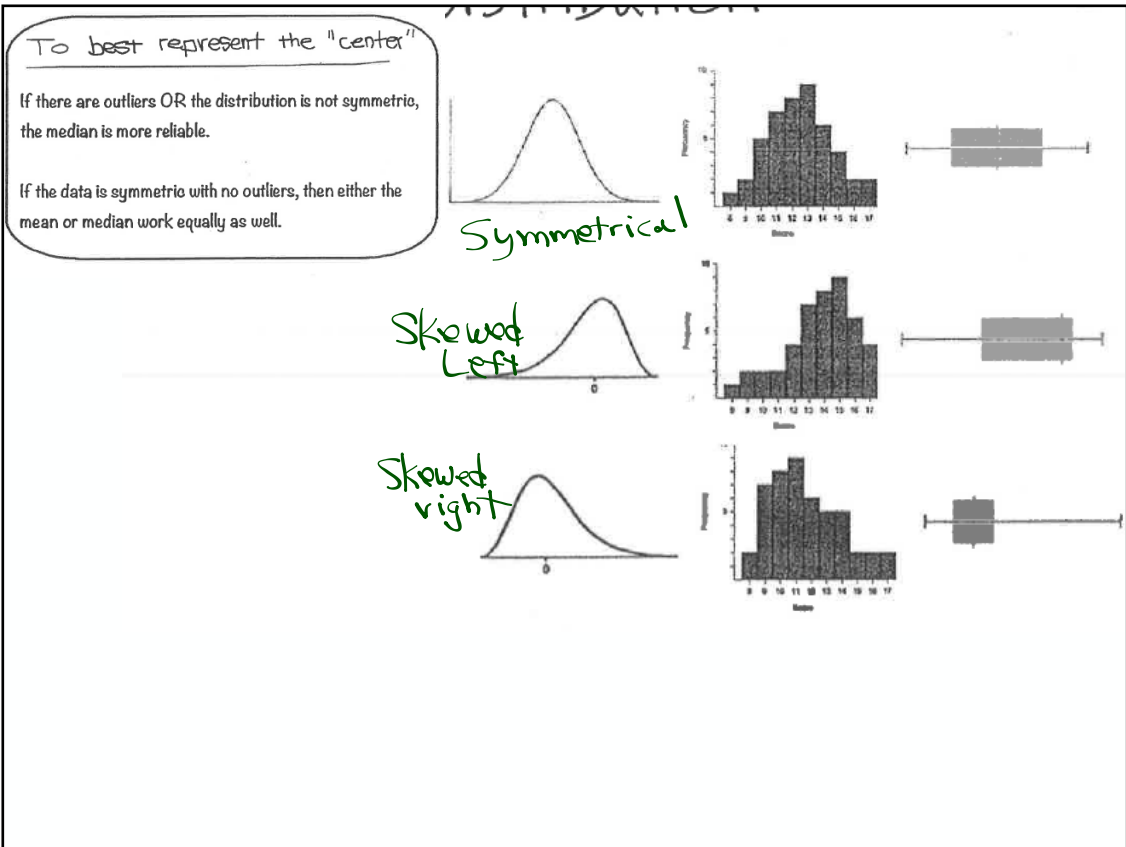
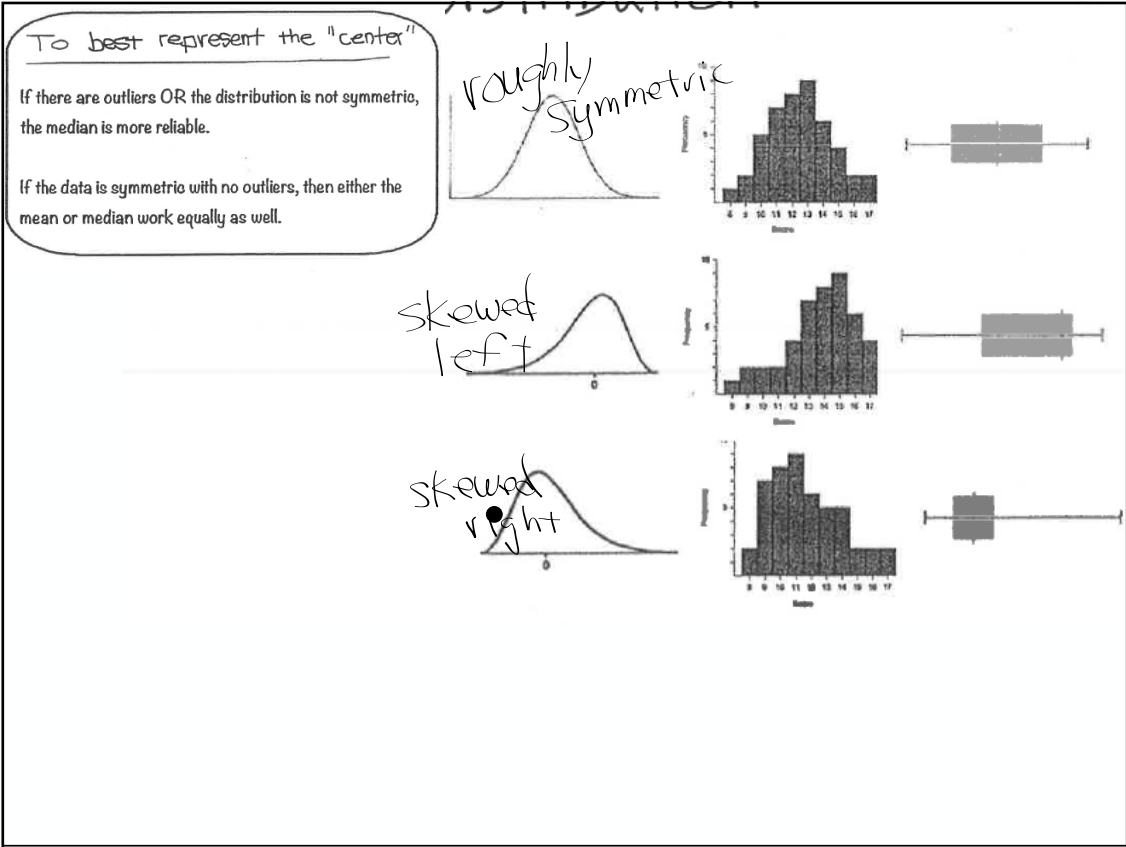
mean $\bar{x} = 31.8$

median 31.3

because data
 is skewed,
 median is
 more trustworthy

2. Calculate the inter-quartile range (IQR) 5.75
3. Calculate the mean run time and the median run time
mean 31.8 median 31.3

4. Is the mean or median run better to represent the "typical" or center run time?
- (It actually depends on the distribution of values which we'll learn about today.)



5. What percent of the runners, at least according to the box plot, is under 34 minutes?

CLASS NOTES - PART 4

Distribution of Data

RAW data → Tally → frequency → HISTOGRAM → BOX plot

A. Survey of the number of vehicles passing by the store between 8:45 am and 9:00 am over a 30 day period.

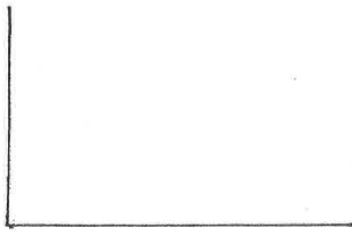
<u>27</u>	<u>23</u>	<u>23</u>	<u>35</u>	32	9
30	40	22	24	52	41
17	28	18	18	31	38
13	38	29	24	39	24
46	24	16	44	32	32

GDC



Number of cars	Tally	Freq
0-9		
10-19		
20-29		
30-39		
40-49		
50-59		

HISTOGRAM

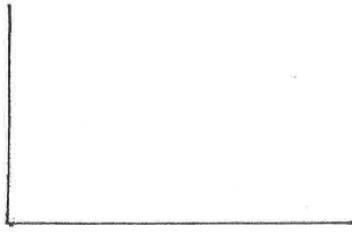


A. Survey of the number of vehicles passing by the store between 8:45 am and 9:00 am over a 30 day period.

<u>27</u>	<u>23</u>	<u>23</u>	<u>35</u>	32	9
30	40	22	24	52	41
17	28	18	18	31	38
13	38	29	24	39	24
46	24	16	44	32	32

Number of cars	Tally	Freq
0-9		1
10-19		5
20-29	(1)	10
30-39		9
40-49		4
50-59		1

HISTOGRAM



B. with a GDC

C. Combo bar Plot histograms

B. Use your GDC to make a histogram of the test averages. (we'll decide as a class on the intervals, but for now use $X_{scale} = 5$ and X_{min} of 40)

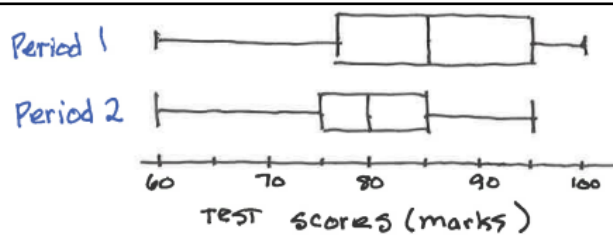
142	169	181	165	170
161	188	173	178	182
170	171	195	168	190
172	163	168	186	197
158	160	187	177	174

$$X_{min} = 100$$

$$X_{max} = 210$$

$$X_{scale} =$$

Finish Tuesday's handout from class



What is the median test score in period 1? —

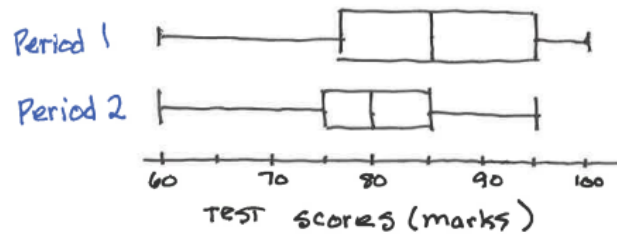
What is ^{the} Period 1 mean score?

What is the range of test scores in period 1? —

What is the IQR (interquartile range) $\frac{1}{2}$

of Period 1 —

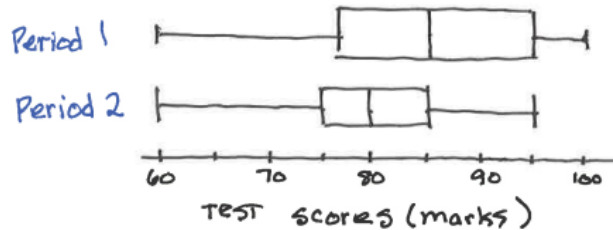
of Period 2 —



Can you determine the number of test takers in either Period?

What percentage of the class in Period 1 is above 85 marks? _____

What percentage of the class in Per. 2 is above 85 marks? _____

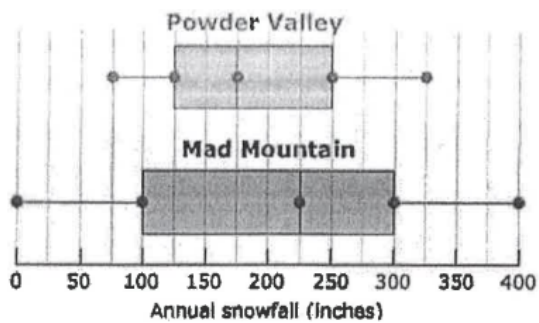


What class, in your opinion, had more Variation in their scores? _____

What I Know About Box Plots

Analyzing the box plots makes it easy to summarize and compare the amounts of annual snowfall for the two resorts.

	Min	Q_1	median	Q_3	max
Powder Valley					
Mad Mountain					



For Mad Mountain, what percent of its years

had less than 225 inches? ____

had less than 100 inches? ____

had a snowfall between 100 and 225 inches? ____

had a snowfall between 100 and 300 inches? ____

For Mad Mountain, how many years were measured?

$$\sum =$$

$$n =$$

$$\bar{x} =$$

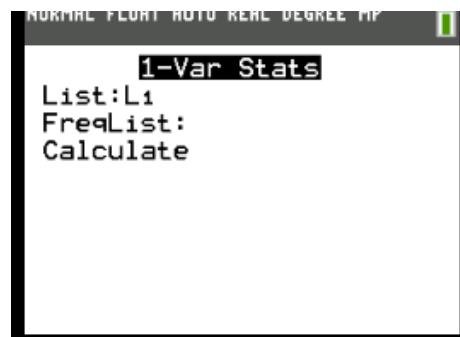
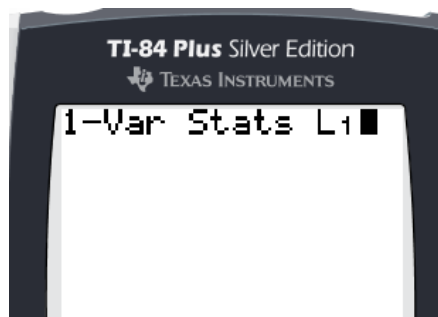
Box Plots With Technology

Using the following set of data that was collected, answer the questions:

12 15 6 12 9 2 21 17 18 17 9 10

QUESTIONS:

1. Write the collected data in ascending order.



2. Find the five-number summary for the above data.

Minimum = _____
Lower Quartile = _____
Median = _____
Upper Quartile = _____
Maximum = _____

Box Plot



BB.

Assignment

1. Prepare for tomorrow's Ch. 4 Test

2. due by Thursday at start of class:

worksheet "Statistics Assignment #1"

TURN IN
NOTEBOOK
BEFORE TEST!

Box Plots and Histograms

Name _____ Date _____

Use the information and the box-and-whiskers plot below for questions 1- 3.

Janelle recorded the length, in minutes, of each movie in her collection. These box-and-whiskers plots show the data for the comedies and dramas.

