

DATA

ASSESSMENT

You may use a calculator to answer the following questions.

1. Scores on the first Physics test are as follows:

Class 1

Student	A	B	C	D	E	F	G	H	I	J
Score	72	43	86	77	93	99	80	92	78	98

Class 2

Student	A	B	C	D	E	F	G	H	I
Score	22	83	69	100	100	72	98	81	75

- a. Sketch the box-and-whisker plot of each data set on the same scale. Identify the five number summary for each. Using 1.5 interquartile ranges up from Q3 and down from Q1, does the data have any outliers?

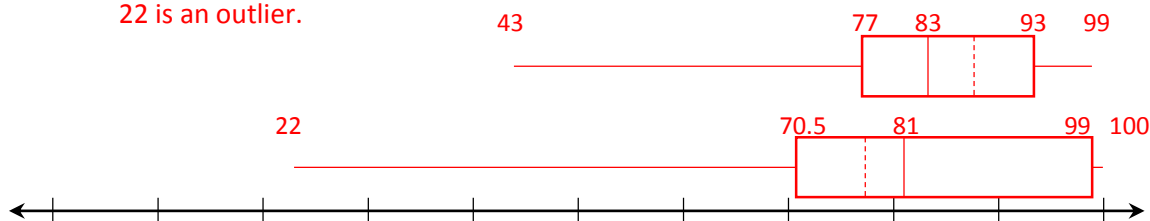
Class 1	Class 2
Max: <u>99</u>	Max: <u>100</u>
Q3: <u>93</u>	Q3: <u>99</u>
Med: <u>83</u>	Med: <u>81</u>
Q1: <u>77</u>	Q1: <u>70.5</u>
Min: <u>43</u>	Min: <u>22</u>
Outliers: <u>43</u>	Outliers: <u>22</u>

Order the data and complete the charts. Draw the box-and-whiskers plots. Identify outliers:

Class 1: $(1.5)(IRQ) = (1.5)(93-77) = 24$. $Q3+24 = 117$, $Q1-24 = 53$. $43 < 53$. 43 is an outlier.

Class 2: $(1.5)(IRQ) = (1.5)(99-70.5) = 42.75$. $Q3+42.75 = 141.75$, $Q1-42.75 = 27.75$. $22 < 27.75$.

22 is an outlier.



- b. What is the mean for each class? (Round to the nearest tenth)

Class 1	Class 2
Mean: <u>81.8</u>	Mean: <u>77.8</u>

- c. Which class did better and why?

ANSWERS VARY- Class 1 did better.

Class 1- slightly higher median, less variability, higher mean.

Class 2- slightly lower median, more variability, lower mean.

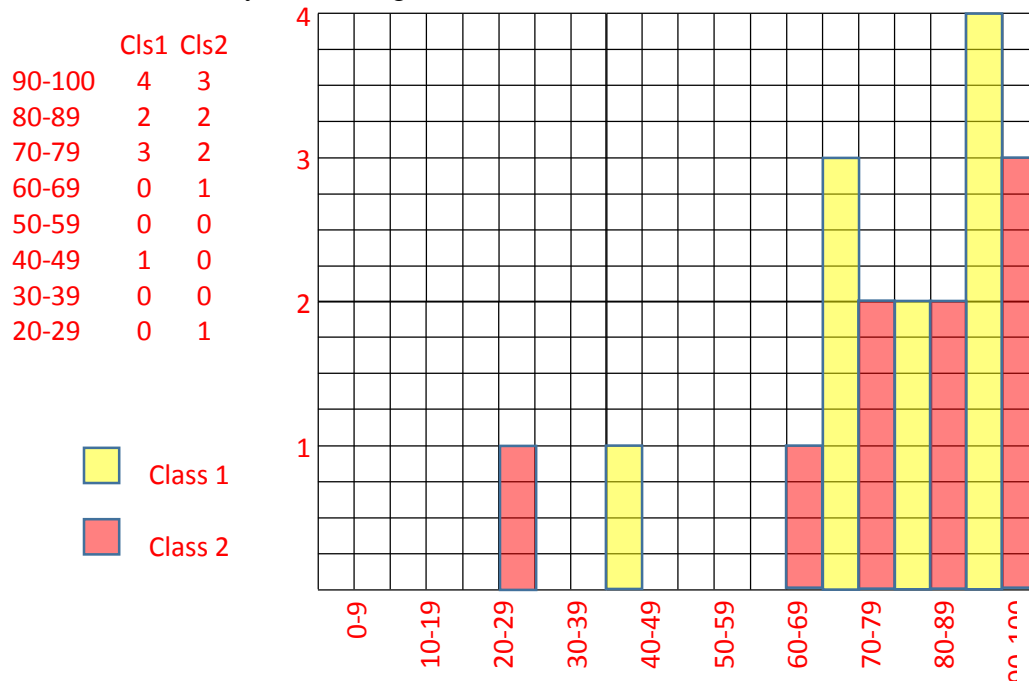
- d. What is the MAD for Class 2?

$$\begin{aligned}
 |100 - 77.8| &= 22.2 & \text{Sum of } |x - \text{mean}| &= 146.2 \\
 |100 - 77.8| &= 22.2 & 146.2/9 &= 16.24 \\
 |98 - 77.8| &= 20.2 \\
 |83 - 77.8| &= 5.2 \\
 |81 - 77.8| &= 3.2 & \text{MAD: } & \underline{16.2} \\
 |75 - 77.8| &= 2.8 \\
 |72 - 77.8| &= 5.8 \\
 |69 - 77.8| &= 8.8 \\
 |22 - 77.8| &= 55.8
 \end{aligned}$$

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d. Create a side-by-side histogram of the two classes. (REMEMBER TO LABEL IT!)



e. What does the histogram tell you about the data? Compare both groups.

The data is skewed to the right and clustered together. There are a couple of values that are not representative of the rest of the data.

2. A sample of students were surveyed about their transportation.

Grade	Walk	Car	Bus	Total
6	13	47	55	115
7	19	35	57	111
8	8	51	75	134
Total	40	133	187	360

a. Complete the frequency table.

b. If there are 1800 students in the school, how many 8th graders might be expected to ride the bus?

8th grade bus riders are 75 out of a sample of 360. The total would be:
 $(1800/360) * 75 = 5 * 75 = 375$.

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- c. Use the data in the original frequency table to generate a row relative frequency table.

Grade	Walk	Car	Bus	Total
6	$13/115 = 0.113$	$47/115 = 0.409$	$55/115 = 0.478$	$115/115 = 1.00$
7	$19/111 = 0.171$	$35/111 = 0.315$	$57/111 = 0.514$	$111/111 = 1.00$
8	$8/134 = 0.060$	$51/134 = 0.381$	$75/134 = 0.560$	$134/134 = 1.00$
Total	$40/360 = 0.111$	$133/360 = 0.369$	$187/360 = 0.519$	$360/360 = 1.00$

NOTE: Divide joint frequency by row marginal frequency.

- d. What is the chance that a chosen student would walk given that they were in 8th grade?

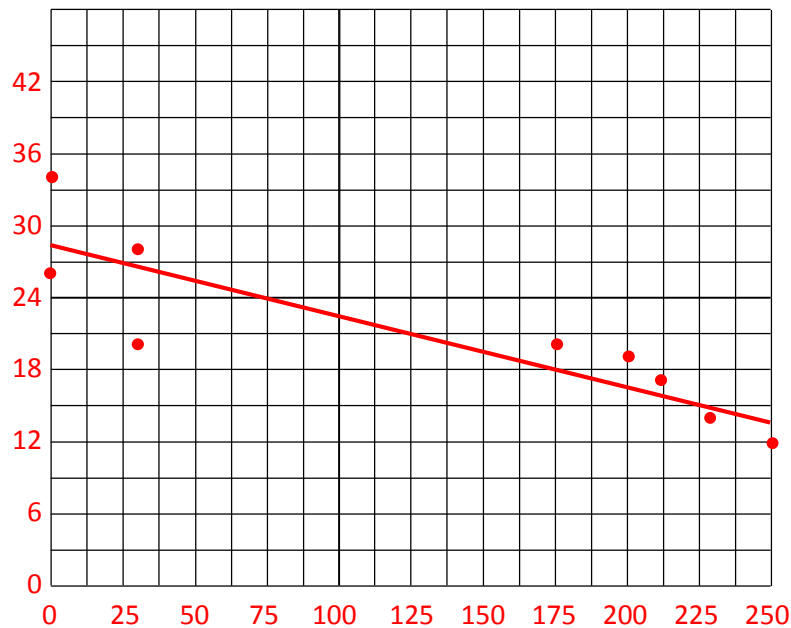
Use the row relative frequency above, "Given in 8th grade" for Walk.

0.060

3. This is a table of exercise times and body mass index.

Exercise Time	0	30	175	200	212	230	250	0	30
BMI (%)	26	20	20	19	17	14	12	34	28

- a. Create a scatter plot of this data.



- b. Use your calculator to find the line of best fit and the correlation coefficient of the data.

Line of Best Fit: $Y = -0.057x + 28.255$

$r =$ -0.869

- c. Describe the relationship between these two data sets.

They are moderately, strongly, negatively correlated.