

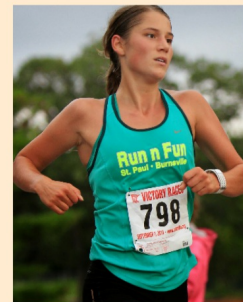
## Welcome MYP 9 Mathematics!

	Assignment Effort Grade (Circle One)	Comments (What was interesting or challenging?)
<b>Monday</b> Date: <u>4-16</u> Topic: <u>No school</u>	0 1 2	
<b>Tuesday</b> Date: <u>4-17</u> Topic: <u>10FG Spread (Range, IQR) &amp; Box Whisker Plot</u>	0 1 2	
<b>Wednesday</b> Date: <u>4-18</u> Topic: <u>Standard deviation, outliers</u>	0 1 2	
<b>Thursday</b> Date: _____ Topic: _____	0 1 2	
<b>Friday</b> Date: _____ Topic: _____	0 1 2	

Warm-up: Ms. Berg wants to average at least ~6 miles each day.

How many miles should she run on Sat?

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
6.8	7.1	5.0	6.5	6.8	3.0	?



Warm-up: Ms. Berg wants to average at least ~6 miles each day.

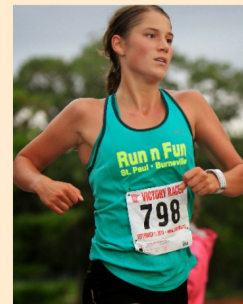
How many miles should she run on Sat?

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
6.8	7.1	5.0	6.5	6.8	3.0	?

$$7 \left( \frac{35.2 + \text{SAT}}{7} \right) = (6)7$$

$$\begin{array}{r} 35.2 + X = 42 \\ - 35.2 \quad - 35.2 \\ \hline \end{array}$$

$$X = 6.8 \text{ mi}$$



## Class Plan:

### 1. Warm-up, homework ??

### 2. Quiz Review Day!

- Graphical Displays: Stem & Leaf Plot, Histogram, Box and Whisker Plot  
*(Cross out 2C, from histogram)*
- Centers: Mean, Median, Mode
- Spread: Range, IQR

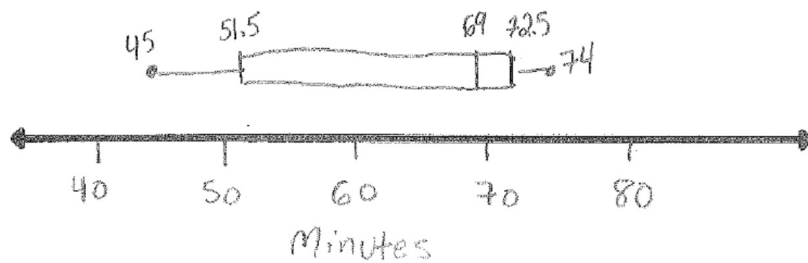
## Exercise Solutions...

1. The lengths in minutes of nine playlists are 45, 63, 74, 69, 72, 53, 72, 73, and 50.  $\sigma \approx 10.6$  minutes

a) Find the 5 # Summary of the data and create a box plot on the line below to show the data spread.

$\{45, 51.5, 69, 72.5, 74\}$

### Playlist of Music



## Exercise Solutions...

b) Calculate and interpret the IQR. Use the IQR to verify that there are *no outliers*.  $IQR = Q_3 - Q_1$

Outlier  $< Q_1 - 1.5IQR$   $1.5IQR = 1.5(21) = 31.5$   $IQR = 72.5 - 51.5$

Outlier  $> Q_3 + 1.5IQR$   $IQR = 21 \text{ min}$

$Q_1 - 31.5$   $Q_3 + 31.5$

$51.5 - 31.5 = 20 \text{ min}$   $72 + 31.5 = 103.5 \text{ min}$

No playlist under 20 min } No playlist above 103.5 min

## Exercises...

c) The standard deviation of the playlists is 10.6 minutes. ( $\sigma \approx 10.6$  minutes).

What does this mean?

On average, each playlist is about 11 minutes from the average of 63 minutes.

d) Suppose playlists that are 1 standard deviation **above** the mean require too much memory on our phones. Which playlist(s) would be too **big** for our phone?

c) Suppose playlists that are 1 standard deviation **above** the mean require too much memory on our phones. Which playlist(s) would be too **big** for our phone?

$$\sigma \approx 10.6 \text{ min}$$

$$\sigma + \bar{x} \approx 10.6 + 63 \approx 73.6 \text{ minutes!}$$

$$\bar{x} \approx 63.0 \text{ min}$$

The 74 min playlist is slightly too big for the available memory

2. Apply the meaning of standard deviation

# Histogram

**2** The table below summarises the best times of 100 swimmers who swim 50 m.

- a** Draw a frequency histogram of the data.
- b** What is the modal class?
- ~~**c** Estimate the mean best time of the swimmers.~~
- d** What percentage of swimmers have a best time less than 35 seconds?

<i>Time <math>t</math> (s)</i>	<i>Frequency</i>
$25 \leq t < 30$	5
$30 \leq t < 35$	17
$35 \leq t < 40$	34
$40 \leq t < 45$	29
$45 \leq t < 50$	15





## Stem and Leaf Plot

6 For the data set given, find the:

- a minimum value
- b maximum value
- c median
- d lower quartile  $Q_1$
- e upper quartile  $Q_3$
- f range
- g interquartile range.

Stem	Leaf
1	2 4 4 6 8
2	2 3 7 7 7 9 9
3	0 0 2 4 5 8
4	0 2 3      4   0 = 40

12, 14, 14, 16, 18, 22, 23, 27, 27, 27, 29, 29, 30,  
30, 32, 34, 35, 38, 40, 42, 43

## Centers and Spread

- 3** The following data set shows the number of points scored by a rugby team in a season of matches:

28, 24, 16, 6, 46, 34, 43, 16, 36, 49, 30, 28, 4, 31, 47, 41, 26, 25, 20, 29, 42

Find the:    **a** mean    **b** median    **c** range    **d** interquartile range.

## Spread: IQR

**4** Jenny's golf scores for her last 20 rounds were:

90	106	84	103	112	100	105	81	104	98
107	95	104	108	99	101	106	102	98	101

- a** Find the median, lower quartile, and upper quartile of the data set.
- b** Find the interquartile range of the data set and explain what it represents.

## Center: Mean

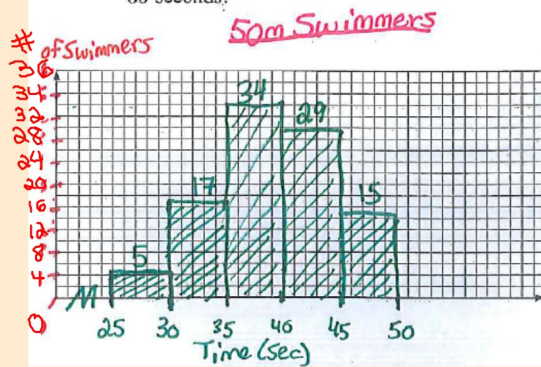
- 3** Eight scores have an average of six. When scores of 15 and  $x$  are added to the set, the average is increased to 7. Find  $x$ .



2 The table below summarises the best times of 100 swimmers who swim 50 m.

- a Draw a frequency histogram of the data.
- b What is the modal class?  $35 \leq t < 40$
- c Estimate the mean best time of the swimmers.
- d What percentage of swimmers have a best time less than 35 seconds?

Med	Time $t$ (s)	Frequency
27.5	$25 \leq t < 30$	5
32.5	$30 \leq t < 35$	17
37.5	$35 \leq t < 40$	34
42.5	$40 \leq t < 45$	29
47.5	$45 \leq t < 50$	15
Total		100



c)  $5(27.5) + 17(32.5) + 34(37.5) + 29(42.5) + 15(47.5) \approx 3910$   
 $\bar{x} \approx \frac{3910}{100} \approx 39.1 \text{ sec}$

d)  $\frac{5+17}{100} = \frac{22}{100} = 0.22$  22% of swimmers < 35 sec.

4 Jenny's golf scores for her last 20 rounds were:

90	106	84	103	112	100	105	81	104	98
107	95	104	108	99	101	106	102	98	101

a Find the median, lower quartile, and upper quartile of the data set.

b Find the interquartile range of the data set and explain what it represents.

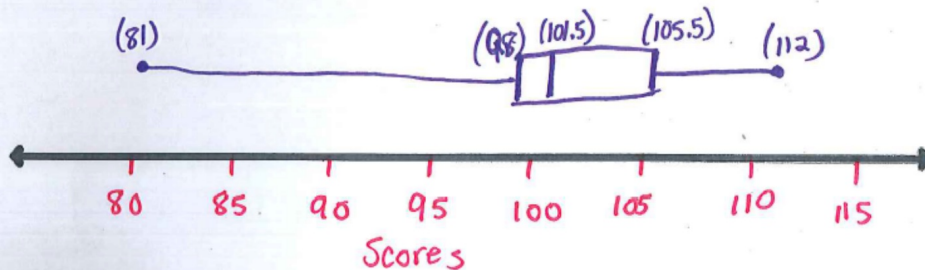
$IQR = 105.5 - 98 = 7.5$  50% of Jenny's games between 98 and 105.5 points.

c Create a Box & Whiskers plot using the 5 # Summary (Min,  $Q_1$ , Median,  $Q_3$ , Max).

81, 84, 90, 95, 98 | 98, 99, 100, 101, 101 | 102, 103, 104, 107, 105 | 106, 106, 107, 108, 112

$Q_1 = 98$        $med = 101.5$        $Q_3 = 105.5$

### Jenny's Rounds of Golf



4 Jenny's golf scores for her last 20 rounds were:

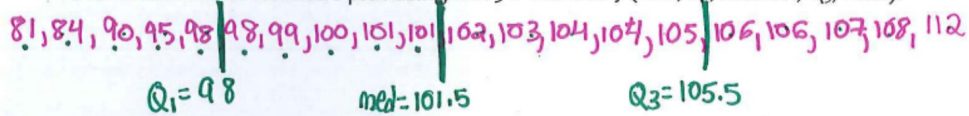
90	106	84	103	112	100	105	81	104	98
107	95	104	108	99	101	106	102	98	101

a Find the median, lower quartile, and upper quartile of the data set.

b Find the interquartile range of the data set and explain what it represents.

$IQR = 105.5 - 98 = 7.5$  50% of Jenny's games between 98 and 105.5 points.

c Create a Box & Whiskers plot using the 5 # Summary (Min,  $Q_1$ , Median,  $Q_3$ , Max).



D Calculate any outliers of the set.

$$1.5(7.5) = 11.25$$

Outlier below

$$98 - 11.25 = 86.75$$

84 is a lower outlier

$$\text{Outlier} < Q_1 - 1.5IQR$$

$$\text{Outlier} > Q_3 + 1.5IQR$$

Outlier Above

$$105.5 + 11.25 = 116.75$$

No scores above 116.75



- 3 Eight scores have an average of six. When scores of 15 and  $x$  are added to the set, the average is increased to 7. Find  $x$ .

$$\left. \begin{array}{l} \frac{8 \text{ scores sum}}{8} = 6 \\ 1^{\text{st}} \text{ 8 scores} \\ \text{total 48 points} \end{array} \right\}$$

$$\begin{array}{l} (8 \text{ scores}) \quad (2 \text{ new scores}) \\ \frac{48 + 15 + x}{10} = 7 \end{array}$$

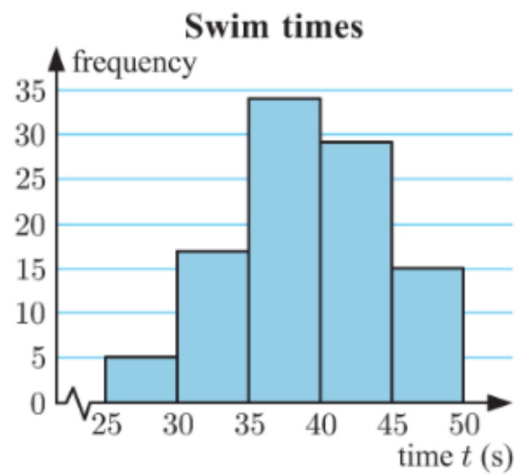
$$10 \left( \frac{63 + x}{10} \right) = (7)(10)$$

$$\begin{array}{r} 63 + x = 70 \\ -63 \quad -63 \end{array}$$

$$\boxed{x = 7 \text{ points}}$$

## SOLUTION

2 a



b  $35 \leq t < 40$  sec

c 39.1 seconds

d 22%

## SOLUTION

**3**   **a**  $\bar{x} \approx 29.6$  points      **b** 29 points      **c** 45 points  
**d** 19.5 points

**4**   **a** median = 101.5,  $Q_1 = 98$ ,  $Q_3 = 105.5$   
**b** 7.5, this is the range of the middle half of the data.

**3**  $x = 7$