Name _____ Math 8A Period ____
Date _____ HW # _____ Standard Deviation

1) The table lists the heights in centimeters of 8 males and 8 females on the U.S. Olympic swim team, all randomly selected from the team that participated in the Olympic Games in 2008.

Heights of male swimmers	196	188	196	185	203	183	183	196
Heights of female swimmers	173	170	178	175	173	180	180	175

2) Use your graphing calculator to complete the table below. Round to the nearest ***hundredth*** if necessary.

	Center		Spread	
	Mean	**Median**	**IQR**	**Standard deviation**
Male swimmers	191.25	192	12	6.99 → 7
Female swimmers	175.5	175	6	3.35

3) What can you conclude about the heights of the male swimmers and the female swimmers?

_____

_____

_____

4) Graph the piecewise function.
SHOW WORK!

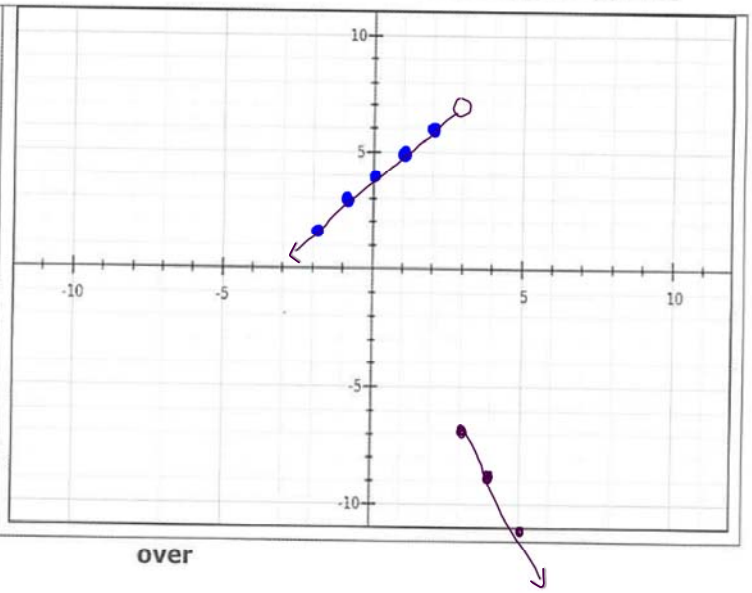
$$f(x) = \begin{cases} -2x - 1, & x \geq 3 \\ x + 4, & x < 3 \end{cases}$$

$-2x-1$

x	y
3	-7
4	-9
5	-11

$x+4$

x	y
2	6
1	5
0	4
-1	3



over

Name _____ Period ____
Date _____ Lesson 3 - Outliers & dot plots

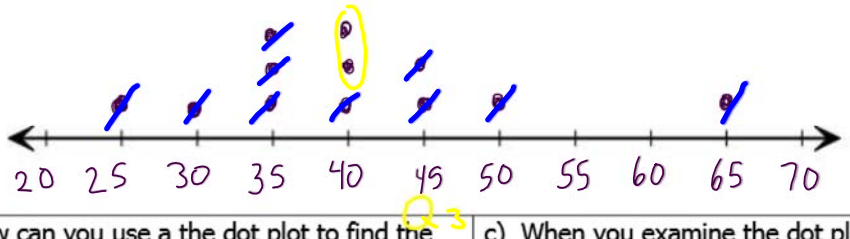
What you will learn... how to interpret differences in shape, center and spread in the context of the data sets, accounting for possible effects of extreme data points, known as outliers.

A dot plot is a data representation that uses a number line and x's, dots, or other symbols to show frequency. Dot plots are sometimes called line plots.

For example:
1) Twelve employees at a small company make the following annual salaries (in thousands of dollars):

25, 30, 35, 35, 35, 40, 40, 40, 45, 45, 50, 65

a) Choose an appropriate scale for the number line. Create a dot plot of the data by putting an **x** above the number line for each time that the value appears in the data set.



b) How can you use a the dot plot to find the median value? What is the median salary?

40 - Eliminating values on the left and right.

c) When you examine the dot plot above, which data value appears most unlike the other values? Explain.

65, it stands out from the "cluster" of data

An outlier is a value in a data set that is much greater or much less than most of the other values in the data set. Outliers are determined using the first or third quartile and the IQR.

cluster

HOW TO IDENTIFY AN OUTLIER

A DATA VALUE X IS AN OUTLIER IF $x < Q_1 - 1.5(IQR)$ or if $x > Q_3 + 1.5(IQR)$

d) Using the above information, is the salary of $65,000 an outlier? Determine if **$65 > Q_3 + 1.5(IQR)$. SHOW YOUR WORK!**

Q_3 = 45 Q_1 = 35 IQR = 10 $Q_3 + 1.5(IQR)$ = 60

Is $65,000 an outlier? YES

$45+(1.5)(10)$
$45+15=60$

2) Use the following data set to solve each problem: 21, 24, 3, 27, 30, 24

$Q_1 - 21$
$Q_3 - 27$
$IQR - 6$

a) Is there an outlier? If so, justify your answer by using the formula.

$3 < Q_1 - 1.5(IQR) \Rightarrow 3 < 21 - 1.5(6)$
$3 < 21 - 9$
$3 < 12$? Yes!

b) Determine how the outlier affects the mean, median, and range of the data by completing the table below.

	mean	median	range
Set without 3			
Set with 3			

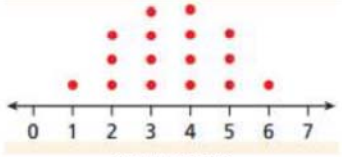
c) Complete each sentence by stating whether the statistic increased, decreased, or stayed the same when the data value 3 was added to the original data set. If the statistic increased or decreased, say by what amount.

The mean _____

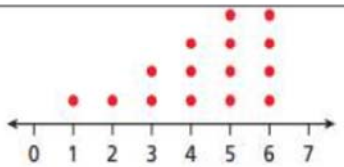
The median _____

The range _____

Comparing Data Distributions - a data distribution can be described as symmetric, skewed to the left, or skewed to the right, depending on the general shape of the distribution in a dot plot or other data display. See the following diagrams:



SYMMETRIC



SKEWED

3) The data table shows the number of miles run by members of two track teams during one day. Make a dot plot and determine the type of distribution for each team. Explain what the distribution means for each.

miles	3	3.5	4	4.5	5	5.5	6
Members of team A	2	3	4	4	3	2	0
Members of team B	1	2	2	3	4	5	5

A

B