# 4.4 Comparing Distributions

NOTES

ALGEBRA

Write your questions here!

**Parallel (Double) Boxplots:** plotting two boxplots on the same number line to compare them.

**Double (Back to Back) Stemplots:** uses one stem with one data set on the left and a different data set on the right.

To compare distributions, we can use SOCS to help us:

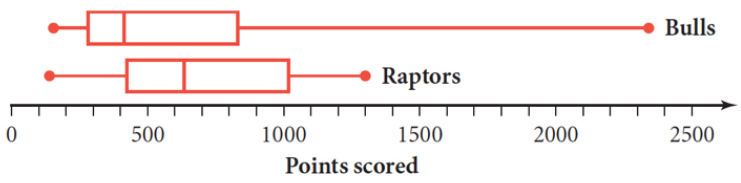
S : _____

O: _____

C: _____

S : _____

Consider the following parallel boxplots comparing the Chicago Bulls and Toronto Raptors from the 1997-1998 season. Compare the two distributions.




**S**
**O**
**C**
**S**

SMP #3

_____

_____

_____

_____

Compare the pulse rates in bpm of Algebra 1 student before and after taking the 2.5 Mastery Check:

| pulse rate before | | pulse rate after |
|---|---|---|
| 9 8 8 8 | 6 | |
| 8 6 6 4 1 1 0 | 7 | |
| 8 8 6 2 | 8 | 6 7 8 8 |
| 6 0 | 9 | 0 2 2 4 5 8 9 9 |
| 4 | 10 | 0 4 4 |
| 0 | 11 | 8 |
| | 12 | 4 4 |
| | 13 | |
| | 14 | 6 |

**Key: where 2 | 8 | 6 means 82 bpm before and 86 bpm after**

_____

_____

_____

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_____

If you need to write down the steps from the calculator, do it below:

Everyone knows that Bean loves his scooter. Brust wants to know if Bean drives his scooter faster on the way TO WORK, or on the way home FROM work. He decided to record his speed several times over the next month. His results are:

**Bean driving TO WORK (km/h)**

| | | | | |
|---|---|---|---|---|
| 43 | 42 | 44 | 39 | 43 |
| 45 | 43 | 45 | 42 | 45 |
| 46 | 44 | 48 | 44 | 47 |
| 63 | 46 | 48 | 45 | |

**Bean driving home FROM WORK (km/h)**

| | | | | |
|---|---|---|---|---|
| 51 | 45 | 44 | 41 | 41 |
| 48 | 47 | 35 | 40 | 42 |
| 48 | 47 | 36 | 38 | 43 |
| 48 | 48 | 37 | 37 | 48 |

Create a double stemplot and parallel boxplots. Use your calculator to help you. Decide which plot display is the best for this data. Then, compare the distributions.

## SUMMARY:

**Now, summarize your notes here!**

## PRACTICE

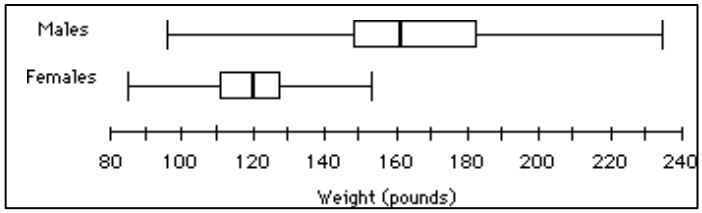
1. Create a double stemplot using the two stemplots given:

**Chapter 6 Test Scores**

| Class A | | Class B | |
|---|---|---|---|
| Stem | Leaves | Stem | Leaves |
| 4 | 9 | 4 | |
| 5 | 5, 7 | 5 | 2, 7 |
| 6 | 6, 6, 8 | 6 | 2, 5, 8, 8 |
| 7 | 2, 8, 8, 8 | 7 | 2, 5 |
| 8 | 4, 5, 7, 8, 8 | 8 | 1, 4, 5, 7, 7 |
| 9 | 1, 5, 5 | 9 | 0, 1, 1, 5, 5, 5 |
| 10 | 0, 0 | 10 | 0 |

**Key: 4 | 9 means 49%**

2. The following boxplots summarizes weights of the male and female students in a class:




**Circle all of the following which are NOT correct.**

(a) About 50% of the male students have weights between 150 and 185 pounds.
(b) About 25% of female students have weights more than 130 pounds.
(c) The median weight of male students is about 162 pounds.
(d) The mean weight of female students is about 120 pounds because of symmetry.
(e) The male students have less variability than the female students.

3. Barry Bonds and Babe Ruth are two of the most successful hitters in baseball history. The following data represents the number of HRs each hitter hit in their career:

**Barry Bonds** (1986 – 2007): 16, 25, 24, 19, 33, 25, 34, 46, 37, 33, 42, 40, 37, 34, 49, 73, 46, 45, 45, 5, 26, 28
**Babe Ruth** (1915 – 1935): 4, 3, 2, 11, 29, 54, 59, 35, 41, 46, 25, 47, 60, 54, 46, 49, 46, 41, 34, 22, 6

Complete parallel boxplots of the distribution of HRs hit over the hitters' careers. Then, use sentences to compare the distributions.

4. Vertical boxplots are similar to horizontal boxplots. Use the boxplots to determine if the statements are true or false.

| Statement | Circle One! | |
|---|---|---|
| a. The cheapest homes are in City 1. | True | False |
| b. City 3 has the greatest standard deviation. | True | False |
| c. City 2 has the greatest interquartile range. | True | False |
| d. The median sale price in City 3 is smaller than the minimum home price in City 1. | True | False |
| e. The top 50% of homes in City 2 cost more than all of the houses in City 2 and City 3. | True | False |
| f. City 3 has the smallest variation in home sale prices. | True | False |

4. Multiply: $(3-2x)^2$

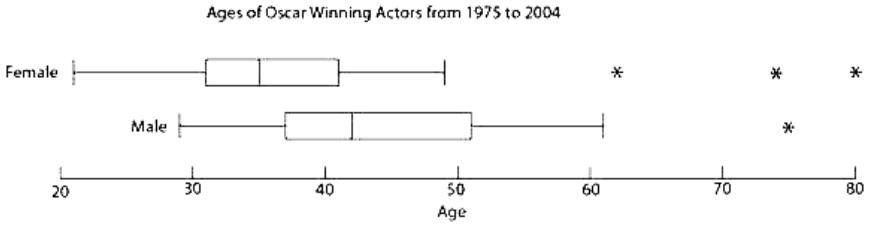
5. Solve the following equation for y: $1.2x - y = 12$

6. Solve the following system: $\begin{cases} 2x - y = -100 \\ 2x + 2y = 200 \end{cases}$

## 4.4 Comparing Distributions

**4.4 WRAP UP**

1. Compare the ages of male and female winning Oscar actors using the boxplots at the right.




2. The table to the right shows the average monthly temperatures for Albuquerque, New Mexico and Green Bay, Wisconsin. Construct a double stemplot and compare the average temperatures of the two cities.

| Month | Albuquerque | Green Bay |
|---|---|---|
| Jan | 34 | 14 |
| Feb | 40 | 18 |
| March | 46 | 30 |
| April | 55 | 44 |
| May | 64 | 55 |
| June | 74 | 64 |
| Jul | 78 | 69 |
| Aug | 75 | 67 |
| Sept | 68 | 59 |
| Oct | 57 | 48 |
| Nov | 44 | 34 |
| Dec | 35 | 20 |

**A1 4.4 EXIT TICKET –**

Which is easier, A or B? A. Creating a boxplot from a stemplot.

B. Creating a stemplot from a boxplot.

SMP #3

Justify your answer using complete sentences below: