1.9 Comparisons of the Distributions for One Quantitative Variable

AP Statistics Name: _____ **CA #1**

Use the scenario to answer the following questions.

1. A chess player's rating increased to 1650 after a tournament, where the average rating among players in their division was 1500, with a standard deviation of 120. Calculate and interpret the player's z-score.

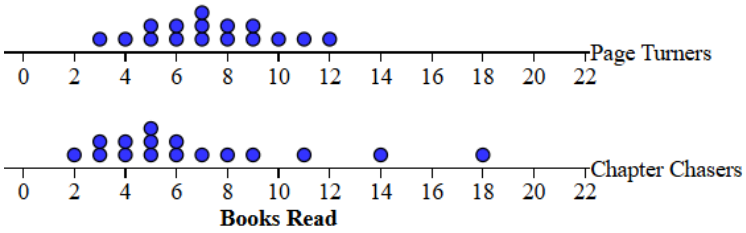
2. A runner completed a 5K in 23.5 minutes, where the average time for runners in their age group was 26 minutes, with a standard deviation of 2 minutes. Calculate and interpret the runner's z-score. Is this a good performance? Explain.

3. Two gymnasts competed in floor routines judged on different scales. Zara scored a 9.2 on a 10-point scale, where the average score was 8.5 with a standard deviation of 0.4. Leo scored a 48 on a 50-point scale, where the average score was 42 with a standard deviation of 3. Who performed better relative to their own routine's judging pool?

4. Jayden logged 62 community service hours, where his school's average was 45 hours with a standard deviation of 10 hours. Camila logged 55 hours, where her school's average was 40 hours with a standard deviation of 8 hours. Who performed better relative to their own school's average?

© The Algebros from FlippedMath.com

5. Two book clubs compare the number of books read over the summer: Page Turners and Chapter Chasers. Raw data below (build a dotplot for each):



	Page Turners	Chapter Chasers
Mean	7.31	6.88
Std Dev	2.5	4.32
Min	3	2
Q1	5.5	4
Median	7	5.5
Q3	9	8.5
Max	12	18

Describe and compare the distributions of books read by the book clubs.

Answers to 1.9 Corrective Assignment

1. $z = \frac{1650-1500}{120} = 1.25$
The player's rating of 1650 is 1.25 standard deviations above the mean of 1500.

2. $z = \frac{23.5-26}{2} = -1.25$
The runner's time of 23.5 minutes is 1.25 standard deviations below the mean of 26 minutes.

3. $z_{Zara} = \frac{9.2-8.5}{0.4} = 1.75$

$z_{Leo} = \frac{48-42}{3} = 2.0$

Leo performed better relative to his own judging pool.

4. $z_{Jayden} = \frac{62-45}{10} = 1.7$

$z_{Camila} = \frac{55-40}{8} = 1.875$

Camila performed better relative to her own school.

2.
The distribution of books read over the summer is unimodal and approximately symmetric for the Page Turners and skewed right for Chapter Chasers. Chapter Chasers has an outlier at 18 because it falls above the upper fence: 8.5 + 1.5(4.5) = 15.25 books. Since Chapter Chasers is skewed right and has an outlier the best measure of center is median and best measure of variability is IQR because they are resistant to skewness and outliers. Page Turners has a median of 7 books which is greater than Chapter Chasers median of 5.5 books. The Page Turners IQR 9 – 5.5 = 3.5 books which is less than Chapters Chasers 8.5 – 4 = 4.5 books. This means Page Turners has less variability and typically read more books than Chapter Chasers.

© The Algebros from FlippedMath.com