

Name: KEY

Date: _____

Period: _____

Analyzing Numerical Data: Indices Using Weighted Sums and Averages

I.C Student Activity Sheet 8: Quarterback Ratings

The National Football League (NFL) rates quarterbacks for statistical purposes against a fixed performance standard based on the statistical achievements of all qualified pro passers since 1960. This system allows passing performances to be compared from one season to the next.

1. What is the purpose of a Quarterback Rating (i.e. what is it used for, how is it used, etc.)?

The measure of the performance of passers, primarily quarterbacks. Contributions weighted based on importance of situation in determining game outcome. Rating between 0-158.3.

2. What categories are used to compute the quarterback rating?

1. percentage of completions per attempt
2. average yards gained per attempt
3. percentage of touchdown passes per attempt
4. percentage of interceptions per attempt
5. attempts

3. What formula is used for compiling the quarterback rating (QR)?

$$\text{QR} = \frac{0.05(\% \text{ comp} - 30) + 0.25(\text{avg. yd} - 3) + 0.2(\% \text{ TD}) + (2.375 - 0.25(\% \text{ INT}))}{6}$$

$$\text{QR} = \frac{25 + 10(\% \text{ comp}) + 40(\% \text{ TD}) - 50(\% \text{ INT}) + 50(\text{yd})}{12}$$

4. Who are some notable players throughout history that have some of the highest slugging averages to date?

Aaron Rodgers, Steve Young, Tom Brady, Peyton Manning, Tony Romo.

5. For the 2016 season, New England Patriots quarterback ^{Tom} Brady completed 291 passes in 432 attempts for a total of 3554 yards, with 28 touchdowns and 2 interceptions. Verify that Brady's quarterback rating for the 2016 season is approximately 112.2. Round each value to the nearest tenth.

- Percent of completions per attempt (%COMP) = $291/432 = 0.674 = 67.4\%$
- Percent of touchdown passes per attempt (%TD) = $28/432 = 0.065 = 6.5\%$
- Percent of interceptions per attempt (%INT) = $2/432 = 0.005 = 0.5\%$
- Average yards gained per attempt (YD) = $3554/432 = 8.2$

- QB Rating =

$$\frac{25 + 10(67.4\%) + 40(6.5\%) - 50(0.5\%) + 50(8.2)}{12}$$

$$= \frac{1344}{12} = \boxed{112}$$

6. As of 2016, Aaron Rodgers has the highest career quarterback rating in NFL history. He completed 3,034 passes in 4,657 attempts for a total of 36,287 yards, with 297 touchdowns and 72 interceptions. Find Rodgers' career quarterback rating.

$$\% \text{ COMP} = 3034/4657 = 0.651 = 65.1\%$$

$$\% \text{ TD} = 297/4657 = 0.064 = 6.4\%$$

$$\% \text{ INT} = 72/4657 = 0.015 = 1.5\%$$

$$\text{yd} = 36287/4657 = 7.8$$

$$\text{QR} = \frac{25 + 10(65.1\%) + 40(6.4\%) - 50(1.5\%) + 50(7.8)}{12}$$

$$= \frac{1247}{12} = \boxed{103.9}$$