

Activity 3: Batting Averages and More Solutions

A.

1.

Player	Games	At Bats	Hits	Batting Average (BA)	Runs Batted In (RBI)	Home Runs	HR/ Games	HR/ At Bats	HR/ Hits
Hank Aaron	3298	12364	3771	0.305	2297	755	0.229	0.061	0.200
Rod Carew	2469	9315	3053	0.328	1015	92	0.037	0.010	0.030
Ty Cobb	3034	11429	4191	0.367	1961	118	0.039	0.010	0.028
Lou Gehrig	2164	8001	2721	0.340	1990	493	0.228	0.062	0.181
Rogers Hornsby	2259	8173	2930	0.358	1584	301	0.133	0.037	0.103
Reggie Jackson	2820	9864	2584	0.262	1702	563	0.200	0.057	0.218
Mickey Mantle	2401	8102	2415	0.298	1509	536	0.223	0.066	0.222
Willie Mays	2992	10881	3283	0.302	1903	660	0.221	0.061	0.201
Stan Musial	3026	10972	3630	0.331	1951	475	0.157	0.043	0.131
Babe Ruth	2503	8399	2873	0.342	2211	714	0.285	0.085	0.249
Ted Williams	2292	7706	2654	0.344	1839	521	0.227	0.068	0.196

2.

Player	HR/Game
Babe Ruth	0.285
Hank Aaron	0.229
Lou Gehrig	0.228
Ted Williams	0.227
Mickey Mantel	0.223
Willie Mays	0.221
Reggie Jackson	0.2
Stan Musial	0.157
Rogers Hornsby	0.133
Ty Cobb	0.039
Rod Carew	0.037

3.

Player	HR/At bat
Babe Ruth	0.085
Ted Williams	0.068
Mickey Mantel	0.066
Lou Gehrig	0.062
Willie Mays	0.061
Hank Aaron	0.061
Reggie Jackson	0.057
Stan Musial	0.043
Rogers Hornsby	0.037
Rod Carew	0.01
Ty Cobb	0.01

4.

Player	HR/Hit
Babe Ruth	0.249
Mickey Mantel	0.222
Reggie Jackson	0.218
Willie Mays	0.201
Hank Aaron	0.2
Ted Williams	0.196
Lou Gehrig	0.181
Stan Musial	0.131
Rogers Hornsby	0.103
Rod Carew	0.03
Ty Cobb	0.028

5. Student answers will vary.

Sample: Babe Ruth has the highest ratio in all three categories computed.

6. Student answers will vary.

Sample: This will be a very personal or statistical argument and difficult to provide an example.

7. Student answers will vary.

Sample: Henry Aaron has the most home runs in a career and ranks second in home runs per game. He ranks sixth in home runs per time at bat and fifth in home runs per hit. No other player, outside of Babe Ruth, ranks that consistently high.

B. Solution:

Let H = the number of hits prior to Saturday night's game.

Let AB = the number of times at bat prior to Saturday night's game.

$$H/AB = 0.350 \text{ and } (H + 3)/(AB + 5) = 0.352$$

$$H = 0.350AB \text{ and } H + 3 = 0.352(AB + 5)$$

$$H + 3 = 0.352AB + 1.760$$

$$H = 0.352AB + 1.760 - 3$$

$$H = 0.352AB - 1.24$$

By substitution: $0.350AB = 0.352AB - 1.24$

$$1.24 = 0.002AB$$

$$1.240.002 = AB$$

$$620 = AB$$

$$0.35(620) = H$$

$$217 = H$$

Prior to that Saturday night's game Mark McGuire had 217 hits and 620 times at bat.

C. Solution:

Percentage, which is what batting averages measure, is a relative measurement. The measure is relative to the base, which represents 100%. For example, we know that 50% is always half, however, 50% of 100 items is 50 while 50% of 40 items is only 20. Increasing the 50 items to 53 and the base number to 105 produces a percentage of 50.5%, while increasing 20 to 23 and 40 to 45 produces a percentage of 51.1%.

Since the base (number of times at bat) is constantly changing, the increase in percentage relative to the increase of 3 hits and 5 times at bat will also change. Simply, the total number of hits and at bats is never the same. Hence, the ratio of hits to times at bat will have different values because the numerator and denominator of each ratio are different numbers.