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and **Faggella**. *Predicting a Team's Winning Percentage Using (Run Scored - Runs Allowed)*.

Bill James developed the Pythagorean Theorem for Baseball, $W/L = (RS/RA)^2$. In this formula for an entire season, W = team wins, L = team loses, RS = runs scored by a team and RA = runs allowed by a team. Alternately, this formula says a team's winning percentage $W\% = 100*(RS)^2/[(RS)^2+(RA)^2]$. Using regression analysis, sabermetricians have shown that for a typical season the exponent will be close to 2. The research that follows was a joint effort between my student Kevin Faggella and me. We looked at the linear equation $W\% = m*(RS-RA) + b$. Using regression analysis, we showed that for any season in Major League Baseball (MLB), $m = \Sigma [(RS-RA)*W\%]/\Sigma (RS - RA)^2$ and $b = .50$. This same formula also works for the other two major professional sports leagues, the NFL and the NBA. The strong positive correlation between each year's $\Sigma[(RS - RA)*W\%]$ and each year's $\Sigma(RS - RA)^2$ allowed us to replace m by an approximating constant. For MLB, $W\% = .000683*(RS-RA) + .50$, for the NFL $W\% = .001538*(PS-PA) + .50$ and for the NBA, $W\% = .000364*(PS-PA) + .50$. PS is the season's points scored by a team and PA is the season's points allowed by a team. We found a strong positive correlation in each sport between the exponent in the Pythagorean Theorem and the slope m . (Received June 16, 2013)