

Show all work and clearly explain your solution path for full credit.

1. In April 1998, the basketball players Michael Jordan and Shaquille (Shaq) O'Neal were vying for the season individual scoring title until the last game of the season. The scoring title is won by the player with the highest average number of points per game, calculated by dividing the total number of points by the number of games the player has played. Before the last game, Jordan had scored 2313 points in 81 games, for an average of 28.6 points/game (customarily, averages are rounded to the nearest tenth). Shaq had scored 1666 points in 59 games for an average of 28.2 points/game. No one else had a chance to win the title.¹
 - a. Given the above information, with what numbers of points in their final games does Shaquille O-Neal win the scoring title over Michael Jordan? Show all work and clearly explain your solution.
 - b. If Jordan scores more points in the last game than Shaq, will he necessarily win?
 - c. If Shaq score more points in the last game than Jordan, will he necessarily win?
 - d. It happened that Jordan scored 44 points in his last game of the regular season. His game was over before Shaq's game started. How many points would Shaq have needed to win the title?
 - e. It turns out that Shaq scored 39 points in his last game. Suppose that Shaq's game had been played before Jordan's. How many points would Jordan have needed to win the title?
2. List two CCSSM content standards that were met by your solution to problem 1. If it is not completely obvious how your solution meets the standard, then explain.
3. List the two Standards for Mathematical Practice that you feel were most relevant to solving problem 1 and explain how those were evident in the solution you wrote down.
4. Mom can rake all the leaves from the vast front yard in about 30 minutes. With help from her youngest child, Sonny, she can rake the yard in about 20 minutes. How long would it take Sonny working by himself?
5. Mindy is mixing up some sugary punch for tomorrow's fund-raiser. She took over for someone who goofed up. She knows that she already has 20 liters of an 18% punch mix (i.e. 18% sugary punch mix, 82% water) and 50 liters of a 30% punch mix. How can she make both batches into a 25% mixture by mixing the existing punches and adding only water?
6. What is the largest power of 2 that divides $800!$ without a remainder? (Hint: Don't try to do $800!$ on your calculator 😊)

¹ From *Mathematics for High School Teachers: An Advanced Perspective* by Usiskin, Peressini, Marchisotto and Stanley