

At least 5 of these questions (potentially in a slightly modified form) will appear on exam #3.

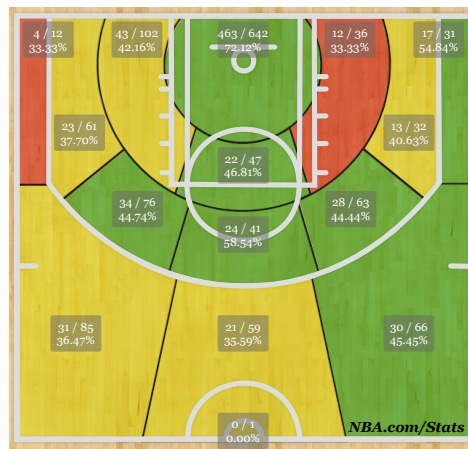
1. Provide a data set where the median is equal to the mean, and the mode is greater than the median.
2. A four of a kind is four of one card and one of another (for example, four kings and a jack) and a full house is three of one card and two of another (for example, three kings and two jacks). In poker, four of a kind beats a full house. Count the number of ways to get each and explain why a four of a kind should be a full house.
3. A basketball coach has two potential starting lineups, *A* and *B*. If he starts lineup *A*, the fewest points his team will score is 55 and the most 87, the lower quartile is 68, the upper quartile is 76, and the median is 74. If line *B* starts, the fewest points his team will score is 42 and the most 103, the lower quartile is 54, the upper quartile is 80, and the median is 60. Draw an appropriate representation of this data, and argue about which starting lineup the coach should use. Does your answer change if the opponent averages 82 points a game? If the opponent averages 60 points a game?
4. A carnival barker is offering two games, *A* and *B*.

Game A There is a urn containing 4 blue marbles and 12 white marbles, you draw a marble, put it back, and draw a second marble. If they are both blue, you win.

Game B There is a urn containing three green marbles and 16 blue marbles. You draw a marble, and discard it if it is not blue, then you draw a second marble. If either of the marbles were blue, you win.

Which game should you want to play?

5. Sally tallies the roll of a pair of dice 6 times and calculates the mean and mode of her data, getting 6 and 7, respectively. If four of the rolls were 7, 11, 2, and 4, what were the remaining two rolls?
6. Below is a graphic representing the shot distribution of NBA star LeBron James for the 2012-2013 season (retrieved from the NBA.com/Stats page). What percentage did he shoot from 3-point range? Note: 3-point range consists of the outermost 6 regions.



7. The z -score of 72 is 2.5 while the z -score of 51 is -1, what is the mean and standard deviation of the data?
8. A four question multiple choice test has 4 questions each with 5 options. If you guess randomly on each question, what is the probability of getting at least 50%?
9. How many ways are there to line up 3 boys and 3 girls so that no boys are next to each other?
10. How many ways are there to roll a prime when rolling a pair of dice?
11. What is the probability of drawing at least two hearts when drawing three cards successively?
12. The standard deviation of a set of data is 0, what does this tell you about the data?
13. The mean of a data set is sometimes referred to as the first moment of the data set. In a similar manner the mean of the squares of the data is referred to as the second moment of the data. Calculate the mean, standard deviation, second moment of $\{0, -2, -3, 1, 2, 2\}$. What do you observe about the relationship between these three terms?
14. What is the probability that arranging the letters $\{L, O, U, I, S, V, I, L, L, E\}$ randomly spells out Louisville?
15. A certain medical test has a false positive rate of 5% and a false negative rate of 0% (that is, if you have the disease the test will determine it with certainty but if you don't have the disease there is a 5% chance that the test will say that you do). If only 1% of the population has the disease, what is the probability you have the disease if you test positive?