Stat 202 Exam 1 Study Guide 2

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For the first set of problems, consider a twelve-sided die with faces numbered 1 through 12. Let S be the sample space consisting of the possible numbers shown on the face of the die when thrown:

$$S = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}.$$

Consider events:

$$A = \{2, 4, 6, 7\}$$
$$B = \{3, 4, 6, 9\}$$
$$C = \{8, 9, 10, 11\}$$

The die is fair. All faces are equally likely to appear.

1. What event is $A \cup B$?

2. What event is $A \cap B$?

3. What event is $A \cap C$?

4. What event is A^c?

5. What is the probability that A occurs or C occurs?

6. What is the probability that B does not occur?

7. What is the probability that A occurs and C occurs.

8. What is the probability of seeing a 1, 2, 3, or 4, six or more times in 10 rolls of the twelve sided die?

9. Simulate 500 data points from a standard normal distribution with fixed seed 10. Transform the data according to the transformation

$$x_{new} = 4x_{old} + 3.$$

Report the 5-number summary of the transformed data.

10. SAT scores are approximately Normal with mean 1509 and standard deviation 321. How high do you need to score to fall exactly on the 93nd percentile?

11. SAT scores are approximately Normal with mean 1509 and standard deviation 321. What percentile is a score of 1750?

12. SAT scores are approximately Normal with mean 1509 and standard deviation 321. What is the Z-score corresponding to a raw score of 1750?

13. SAT scores are approximately Normal with mean 1509 and standard deviation 321. What is the raw score corresponding to a Z-score of 1.3?

14. SAT scores are approximately Normal with mean 1509 and standard deviation 321. What proportion of students score between 1750 and 1850?