Part III: Anticipating Patterns

Probability and the study of randomness accounts for 20%-30% of the material covered on the AP Exam. "*Probability is the tool used for anticipating what the distribution of data should look like under a given model.*"

Check your understanding of the following topics from Chapters 6-9 of YMS2e.

III. ANTICIPATING PATTERNS: EXPLORING RANDOM PHENOMENA USING PROBABILITY AND SIMULATION

A. Probability
- ☐ 1. Interpreting probability, including long-run relative frequency interpretation
- ☐ 2. "Law of Large Numbers" concept
- ☐ 3. Addition rule, multiplication rule, conditional probability, and independence
- ☐ 4. Discrete random variables and their probability distributions, including binomial and geometric
- ☐ 5. Simulation of random behavior and probability distributions
- ☐ 6. Mean (expected value) and standard deviation of a random variable, and linear transformation of a random variable

B. Combining independent random variables
- ☐ 1. Notion of independence versus dependence
- ☐ 2. Mean and standard deviation for sums and differences of independent random variables

C. The normal distribution
- ☐ 1. Properties of the normal distribution
- ☐ 2. Using tables of the normal distribution
- ☐ 3. The normal distribution as a model for measurements

D. Sampling distributions
- ☐ 1. Sampling distribution of a sample proportion
- ☐ 2. Sampling distribution of a sample mean
- ☐ 3. Central Limit Theorem
- ☐ 4. Sampling distribution of a difference between two independent sample proportions
- ☐ 5. Sampling distribution of a difference between two independent sample means
- ☐ 6. Simulation of sampling distributions
- ☐ 7. t-distribution
- ☐ 8. Chi-square distribution

Part III: Anticipating Patterns

AP Exam Free Response Questions Related to Anticipating Patterns in YMS2e
Adapted from a compilation by Jared Derksen and Duane Hinders

Chapter 6: Probability and Simulation				
1997:3	1998:6bc	1999:4b,5	2001:3	2002B:2ac
2003B:2,5a	2004:3b,4a	2005B:6cd	2006:3b	2006B:3b

Chapter 7: Random Variables					
1998:6e	1999:5b	2000:6bc	2001:2	2002:3b	2002B:2b
2003B:5b	2004:4b	2005:2a	2005B:2	2006:3a	2006B:3ac,6c

Chapter 8: The Binomial and Geometric Distributions			
1998:6d (alternate approach)	2003:3c	2004:3a	2006B:6c

Chapter 9: Sampling Distributions			
1998:1	2004B:3cd	2005:2b	2006:3c
Note: The relatively small number of AP questions directly related to this topic should not be taken as an indication that the material is of marginal importance. In a sense, almost all of the inference problems on the AP Exam could be considered sampling distribution problems.			