# Summary of Probability Rules and Formulas (Chapter 5)

## Concepts

* Find probabilities of two independent events
* Find marginal and conditional probabilities (contingency table)
* Determine if two events are independent (contingency table)

Problems 2, 3, 5, & 6 from the MSL practice test would be good practice.

### Any probability is a number between 0 and 1.

### All possible outcomes together must have probability 1.

, where S = sample space

### Addition of Disjoint Events

### Addition of Non-disjoint Events

### Complement Rule

### Conditional Probability

**OR**

### Multiplication of Dependent Events

**OR**

### Multiplication of Independent Events

**OR**

### Determine if Two Events are Independent

If, events A and B are independent.

# Summary of Random Variables and Probability Models (Chapter 6)

## Concepts

* Find joint probabilities using a tree diagram
* Find expected value (mean) and standard deviation of a random variable
* Find expected value, standard deviation, and probabilities of a Binomial random variable

Problems 9, 10, & 11 from the MSL practice test would be good practice.

### Mean, Variance, and Standard Deviation of Random Variables

|  |  |
| --- | --- |
|  | 1. Multiply each possible value of X by it’s probability. 2. Sum the results. |
|  | 1. Subtract the mean from each possible value of X. 2. Square each difference calculated above. 3. Multiply each squared difference above by the probability of it’s x. 4. Sum the results. |
|  | Take the square root of the variance above. |

### Binomial Mean, Variance, Standard Deviation, and Probability Formulas

…where for k = 0, 1, 2, 3, …, n

# Summary of Normal Distributions (Chapter 7)

## Concepts

* Normal approximation to the Binomial
* Find probabilities of known standardized values using a Z table
* Find z-scores of known probabilities using reverse lookup of a Z table
* Compare two z-scores to determine which is most extreme
* Convert z-scores back to the units of the data

Problems 14, 16, & 19 from the MSL practice test would be good practice. Problems 12, 13, & 15 are not specifically on the test, but they would provide good practice because you will apply the same procedures to answer other problems.

### Standardize a Value

### Convert a z-score to the units of the data

### Required Parameters for Using the Normal Approximation to the Binomial

n is the number of trials

p is the probability of success

1-p is the probability of failure

X is a Binomial random variable taking certain values indicated by the given scenario