**Chapter 9 – Additional Problems with Solution – Helpful for the Homework, and Chapter Quiz on Chapter 9**

**Problem 1:**

Suppose that you are taking a T/F exam and you have no idea at all about the answers to the last three questions. You choose answers randomly and therefore have a 50/50 chance of being correct on any one question.

1) What is the probability that you guessed right on exactly one of the three questions?

2) What is the probability that you guessed right on zero of the three questions?

3) What is the probability that you guessed right on at least two of the questions?

**Solution:**

1) Guessed right on 1st question, wrong on 2nd and 3rd question. Probability = 1/2×1/2×1/2 = 1/8
   Guessed right on 2nd question, wrong on 1st and 3rd question. Probability = 1/2×1/2×1/2 = 1/8
   Guessed right on 3rd question, wrong on 1st and 2rd question. Probability = 1/2×1/2×1/2 = 1/8
   **Total Probability = 1/8 + 1/8 + 1/8 = 3/8**

2) Guessed wrong on 1st question. Probability = ½
   Guessed wrong on 2nd question. Probability = ½
   Guessed wrong on 3rd question. Probability = ½
   **So, the probability that you guessed right on zero of the three questions = 1/2×1/2×1/2 = 1/8**
3) Guessed right on question 1 and question 2. Probability = 1/2×1/2×1/2 = 1/8
   Guessed right on question 2 and question 3. Probability = 1/2×1/2×1/2 = 1/8
   Guessed right on question 1 and question 3. Probability = 1/2×1/2×1/2 = 1/8
   Guessed right on question 1, question 2 and question 3. Probability = 1/2×1/2×1/2 = 1/8
   **So, the overall probability = 1/8 + 1/8 + 1/8 + 1/8 = 1/2**

**Problem 2:**

How many numbers from 1-999 do NOT have any repeated digits?

**Solution:**

9 single digits

+ 9*9 double digits

+ 9*9*8 triple digits = **738**

**Problem 3:**

A certain college class has 100 students. The youngest is 20 years old, the oldest is 37. You want to make a bet that the class contains at least X students of the same age. How large can you make X and still be certain to win your bet?

**Solution:**

N = youngest age = 20 years

M = eldest age = 37 years.

So, (M – N + 1) = (37 – 20 + 1) = 18

Therefore, **X** = **Ceiling (100/18) = 6**

**Problem 4:**

Normal six-sided dice have a different number of pips (dots) on each face, from 1 to 6. You roll two such dice and add the result.

What is the probability of rolling 10+ (rolling 10 and higher than 10)?

**Solution:**

Combinations of pips for 10+ includes (4, 6) (4 pips on die 1, and 6 pips on die 2), (5, 5), (6, 4), (6, 5), (5, 6), (6, 6) – for a total of 6. The total possible combination of pips = 6 × 6 = 36.

**So, the probability of rolling 10+ = 6 / 36 = 1/ 6.**