**Dr. Z.'s Intro to Probability Homework assignment 2**

**1.** Let $E$ be the set
$$E = \{1, 2, 3, 4, 5, 6, 7, 8\} \quad .$$

Let $A$, $B$, $C$ be the subsets
$$A = \{1, 3, 5\} \quad , \quad B = \{5, 7, 8\} \quad , \quad C = \{1, 7, 8\} \quad .$$

Compute the following sets
$$ABC \quad , \quad A^c BC \quad , \quad AB^c C \quad , \quad ABC^c \quad , \quad A^c B^c C^c \quad , \quad A \cup B \cup C \quad .$$

**2.** Suppose that $A$ and $B$ are mutually exclusive events with $P(A) = 0.4$ and $P(B) = 0.3$.

(i) What is the probability that either $A$ or $B$ occur?

(ii) A occurs but B does not

(iii) both A and B occur.

**3.** Out of a class of 20 students, 10 watch football, 15 watch soccer, and 8 watch both. How many students watch neither?

**4.** Out of a class of 100 students,

• 20 students play football

• 30 students play soccer

• 25 students play basketball

• 10 students play football and soccer

• 15 students play football and basketball

• 12 students play soccer and basketball

• 5 students play football soccer and basketball .

How many students play none of the three sports?

**5.** Out of a large group of students it is found that 22% take both calculus and algebra, and 12% take neither of them. The probability that a student takes calculus exceeds by 0.14 the probability that a student takes algebra.

Determine the probability that a randomly chosen member of this group takes algebra?

**6.** A survey of 100 students taken over the last year revealed that

(i) 30 of them smoke

(ii) 50 of them drink

(iii) 20 of them smoke and drink

(iv) 25 go to the gym regularly, and of these, none smokes nor drinks.

Calculate how many of the 100 students neither smoke, nor drink, nor go to the gym.

**7.** Out of a class of 100 students,

• 20 students play football

• 10 students play football and soccer

• 15 students play football and basketball

• 12 students play soccer and basketball

• 5 students play football soccer and basketball .

• 57 students play none of the three sports?

The number of students who play baskeball is 5 less than the number of students who play soccer.

How many students play soccer and how many students play basketball?