**Qn 2**

Two fair dice are thrown. Let 𝐸 be the event that the sum is 8. Let 𝐹 be the event that the first throw is 2. Show that the two events are not independent.

As , the two events are not independent.

**Qn 3**

A pair of dice are rolled. Assume that the dice is fair. Calculate

1. the expected value
2. the standard deviation

of the sum of the two dice.

**Qn 4**

In a course, there are 44 male and 8 female students. Suppose they are ranked according to their scores in Quiz 1.

Assume that no two scores are the same and all rankings are equally likely.

Let 𝑋 denote the highest ranking achieved by a female student. Find 𝑃{𝑋 = 3}.

**Qn 5**

The time in years for a personal computer to function before breaking down is a continuous random variable with probability density function

in which 𝜆 is a constant.

1. Determine 𝜆.
2. What is the expected life time of the computer?
3. What is the probability that it will function less than 6 years?

**Qn 6**

The number of attempts before achieving the first success can be considered as a discrete random variable with a probability mass function. Consider the following question.

The probability of a violin student getting the Distinction in an examination is 0.4. If the student wishes to get a Distinction, what is the expected number of attempts that the student takes the examination? Discuss the assumption(s) made behind your calculations.

[Hint: The probability distribution is a geometric distribution under certain assumptions. Please access the e-book A First Course in Probability in EE3001 Course Reserve Pg. 158-159 for information about the geometric distribution.]

As the number of attempts before achieving the first success can be considered as a discrete random variable with a probability mass function, each attempt should be independence.

So, the probability distribution should be a geometric random variable distribution.

Equation of expected value of a geometric random variable distribution:

Expected number of attempts: