**Qusetion1:**

1.1 We can get:

1.2.1 According to the condition, we have:

We can get:

Then we have:

1.2.2 Assume that:

Then we have:

So is odd function. Thus we have:

And we can also get:

1.3.1

Because:

We can get:

Assume that

We can get:

1.3.2 We need to calculate:

We can see that, when , equals to , always not equals to

So the random variable X, Y are not independent.

**Qusetion2:**

2.1 Given events A and B, then:

Proof:

2.2 Let E1 be the event of choosing bag1, E2 the event of choosing bag2, and A be the event of drawing a green ball.

Then,

Then:

By using Bayes theorem, the probability of drawing a green ball from bag2 out of two bags:

2.3.1 Let E1 be the event of using car, E2 the event of walking, E3 the event of riding bus, and A be the event of late.

We have:

Then:

By using Bayes theorem, the probability of late and riding bus:

2.3.2 Let B be the event of on time.

We have:

By using Bayes theorem, the probability of on time and walking: