Problem - Shark attacks!

During the summer of 2000, six shark attacks were recorded on the Florida beaches. Theories involving the changing of maritime currents, the increase of shark-feeding tourist operations and more limited food supply (for the sharks, not the tourists!) were popularized immediately. The number of attacks was compared to the numbers from the previous 10 years:

Year	No. attacks
1990	1
1991	0
1992	3
1993	2
1994	4
1995	2
1996	3
1997	3
1998	1
1999	1
Total	20

a) This type of random events are well fitted using a Poisson distribution. How surprising is the number of shark attacks in 2000?

b) Suppose that a you spend yearly a 7-day vacation in Florida. On average, how many years will you spend swimming in Florida before a shark attack occurs in one of the days when you are there? (in Florida one can swim 280 days out of 365).

Problem - Lotto 6-49[1]

In Lotto 6-49, six numbers are randomly chosen from 1 to 49 and if you match all six numbers you win the jackpot. Let's say that you are a regular player which means that you buy a ticket twice a week. Let's say that you really want to win and the desire keeps you alive so you do it every week for 100 years.

1)What is the probability that you win sometime during your lifetime?

2)On average, how many times do you need to play before you win twice?

Problem - The Great One

During Wayne Gretzky's seasons as an Edmonton Oiler he scored 1669 times in 696 games. What is the probability of having a scoreless Gretzky in one game? (use Poisson distribution)

Goals	Actual no. games	Predicted with the Poisson
0	69	63.27
1	155	151.71
2	171	181.90
3	143	145.40
4	79	87.17
5	57	41.8
6	14	16.7
7	6	5.72
8	2	1.72
9	0	0.46