Problem Sheet 1

1. Apples falling off a tree randomly in time can be described as a Poisson process with rate $\lambda = 2$ apples per day.

    (a) What is the probability that less than 3 apples fall in a day?

    (b) What is the probability that less than 3 apples fall in a week?

    (c) What is the average time between two consecutive apples falling?

    (d) What is the probability that I wait longer than 12 hours for an apple to fall?

2. During election season political placards are places randomly along the length of the A470, which can be described as a Poisson process in space with rate $\lambda = {}^3/_8$ per mile. 25% of the placards are from the Red party, 40% are from the Yellow party, and 35% are from the Blue party.

    (a) I drive a strech of 55 miles, how many Yellow placards should I expect to see?

    (b) What is the probability of not seeing any Blue placards for 20 miles?

    (c) How long would I have to drive before the probability of having seen a Red placard is greater than 90%?