1. Five cards are randomly dealt from a regular deck of 52 cards. Then, a die is rolled until getting as many sixes as the number of spades dealt (when this number is zero, the die is not rolled at all). Compute

   (a) the expected number of rolls and the corresponding standard deviation,

   (b) the probability that the die will have to be rolled more than 20 times.

2. Consider a branching process which starts with 9 initial members and has the following offspring distribution

number	0	1	2	3	4	5	6
Pr	0.503	0.213	0.149	0.083	0.032	0.017	0.003

   Find

   (a) the expected number of members of Generation 18 and the corresponding standard deviation,

   (b) the probability that Generation 18 will have more than 11 members,

   (c) the probability that extinction will take more than 18 generations,

   (d) the expected number of generations till extinction, and the corresponding standard deviation.

   (e) the expected number of members of the process who will have ever lived up to and including Generation 18, and the corresponding standard deviation,

   (f) the probability that this number will be bigger than 150,

   (g) the expected number of *total* progeny of this process (till its eventual extinction), and the corresponding standard deviation,

   (h) the probability that this number will be bigger than 150.