Challenge 51: Return to Sender

A secretary has 5 envelopes which have different addresses, and 5 letters, a different one for each envelope. If the secretary puts the letters into the envelopes at random, then:

a) What is the probability that they are all in their right envelope?

b) What is the probability that every letter is in the wrong envelope?

c) What is the number of letters the secretary should expect to get in the right envelopes?