**Maths Worksheet Probability**

**Questions 1-3 relate to the** situation where we are picking a card at random from a regular pack of 52 playing cards (with 13 spades; 13 hearts; 13 diamonds; and 13 clubs).

**1.** What is the probability of picking a 7? prob(7) =

a. 1/52

b. 1/7

c. ¼

d. 1/13

e. None of the above

**2.** What is the probability of picking a heart? prob(heart) =

a. 1/52

b. 1/2

c. ¼

d. 1/13

e. None of the above

**3.** What is the probability of picking a 7 given that it is a heart? prob(7 | heart) =

a. ¼

b. 1/52

c. 1/13

d. 1/7

e. None of the above

**Questions 4-7 refer to the following situation:** Suppose now that we remove permanently from the (above-mentioned) pack the 3 and 4 of spades, the 6 of hearts and the 9 of clubs. If we then pick a card from the reduced pack:

**4.** What is the probability of picking a 7? prob(7) =

a. 1/52

b. 1/5

c. 1/3

d. 1/12

e. None of the above

**5.** What is the probability of picking a heart? prob(heart) =

a. 1/52

b. 1/4

c. 1/6

d. 1/13

e. None of the above

**6.** What is the probability of picking a 7 given that it is a heart? prob(7 | heart) =

a. 1/12

b. 1/52

c. 25/48

d. 1/7

e. None of the above

**7.** Are the events “pick a 7” and “pick a heart” independent?

a. Yes

b. No

8. Draw a Gaussian distibution function with mean -2 and variance 2. If you draw a sample from this distribution, what is the most likely value.

9. Assume you draw a dice 6 times and get 2, 3, 4, 1, 2, 3. What are the empirical mean, standard deviation and variance of this sample?

10. If you through a dice more and more often, what will the mean of the numbers you see will converge to? And what the standard deviation?

11. How many elements are in the set A={ x | x in N and x is odd and X is smaller than 50}

12. What is the probability that if you choose 5 students out of 100 that they are all female? Assume that there are as many male as female students. What is the probability that their birthday falls on the same day?