Probability extra questions

May 31, 2020

1. Events A and B are independent.
   Given that $\mathrm{P}(A \cup B) = 0.63$ and $\mathrm{P}(B) = 0.36$, find $\mathrm{P}(A)$.

2. 38% of the students in a class are female. Of the female students in this class, 13% are left-handed, whereas 24% of the male students are left-handed.

   (a) Find the probability that a randomly chosen student from this class is left-handed.

   (b) Find the probability that a randomly chosen student is female, given that the student is left-handed.

3. Two unbiased dice are rolled and the difference between the scores is noted. Using a table of outcomes, find the probability that the difference between the scores is 3.

4. Given that $\mathrm{P}(A) = 0.46$, $\mathrm{P}(B) = \dfrac{5}{7}$, $\mathrm{P}(A \cup B)' = \dfrac{1}{12}$, find $\mathrm{P}(A \cap B)$.

5. In a town, 71% of the population are right-handed, 44% are either right-handed or have blonde hair but not both, and 21% do not have blonde hair.
   A member of this population is selected at random. Find the likelihood that the person:

   (a) is right-handed but not blonde.

   (b) is both right-handed and has blonde hair.

   (c) is right-handed or has blonde hair.

6. A committee of 6 is chosen at random from 9 men and 8 women.
   Find the probability that the committee contains:

   (a) three men and three women.

   (b) at least two members of each sex.

   (c) an even number of women.

7. How many different arrangements of the letters of the word DIPLOMA are possible if there are no restrictions?

   When a random arrangement of DIPLOMA is formed, find the probability that

   (a) the arrangements begin and end with a vowel,

   (b) the vowels appear together?

8. Vehicle license plates are composed of three letters from a 26-letter alphabet, followed by a three-digit number whose first digit cannot be zero.

   (a) How many different license plates are possible?

   (b) Find the probability of a randomly chosen number plate beginning with the letters AB and ending with the digit 0.

Answers

1. 0.422
2. (a) 0.198
   (b) 0.249
3. $\frac{1}{6}$
4. 0.258
5. (a) 0.18
   (b) 0.53
   (c) 0.97
6. (a) 0.21.
   (b) $\frac{30}{139}$.
   (c) 0.0794
7. (a) 0.380
   (b) 0.869
   (c) 0.498
8. 5040
   (a) $\frac{1}{7}$.
   (b) $\frac{1}{7}$.
9. (a) 15,818,400
   (b) $\frac{1}{6760}$