SmartKalike

CBSE Class 12 · Maths

Probability

10 most probable questions for Boards 2027

Q1. 1 mark · Very short answer

Given $P(A|F)=0.6$, $P(B|F)=0.5$ and $P(A\cap B|F)=0.2$, evaluate $P((A\cup B)|F)$.

Answer

$P((A \cup B)|F) = P(A|F) + P(B|F) - P((A \cap B)|F)$
$= 0.6 + 0.5 - 0.2$
$\therefore P((A \cup B)|F) = 0.9$

Q2. 1.5 marks · Short answer

Given $P(A)=0.6$, $P(B)=0.4$ and $P(A\cap B)=0.2$, find $P(A\cup B)$.

Answer

$P(A \cup B) = P(A) + P(B) - P(A \cap B)$
$= 0.6 + 0.4 - 0.2$
$\therefore P(A \cup B) = 0.8$

Q3. 2 marks · Short answer

Let $P(F)=1/3$ for an event F. Evaluate $P(S|F)$ and $P(F|F)$.

Answer

$P(E|F) = P(E \cap F) / P(F)$
$P(S|F) = P(S \cap F) / P(F)$
$= P(F) / P(F)$
$\therefore P(S|F) = 1$
$P(F|F) = P(F \cap F) / P(F)$
$= P(F) / P(F)$
$\therefore P(F|F) = 1$

Q4. 3 marks · Medium answer

A machine is correctly set up with probability 0.8 and incorrectly set up with probability 0.2. The probability that one item is acceptable is 0.9 for a correct setup and 0.4 for an incorrect setup. Assuming the two items' outcomes are independent given the setup, find the probability that the setup was correct given that two items are acceptable.

Answer

Let C be the event of a correct setup and A the event that both items are acceptable.
$P(C) = 0.8,\ P(C') = 0.2$
$P(A|C) = 0.9^2 = 0.81$
$P(A|C') = 0.4^2 = 0.16$
$P(C|A) = P(C)P(A|C) / [P(C)P(A|C) + P(C')P(A|C')]$

= (0.8 × 0.81) / [(0.8 × 0.81) + (0.2 × 0.16)]
= 0.648 / 0.68
∴ P(C | A) = 81/85

Q5. 4 marks · Long answer

The probability of a strike is 0.65. The probabilities that a construction job is completed on time during a strike and when there is no strike are 0.32 and 0.80, respectively. Using the theorem of total probability, calculate the probability that the job is completed on time.

Answer

Let A be the event that the job is completed on time, and B the event that there is a strike.
P(B) = 0.65, P(B′) = 1 − 0.65 = 0.35
P(A | B) = 0.32, P(A | B′) = 0.80
P(A) = P(B)P(A | B) + P(B′)P(A | B′)
= 0.65 × 0.32 + 0.35 × 0.80
= 0.208 + 0.28
∴ P(A) = 0.488

Q6. 5 marks · Long answer

Let P(E | F)=3/8, where P(F)>0. Prove that P(E′ | F)=1−P(E | F), and evaluate P(E′ | F).

Full answer on SmartKalike: https://smartkalike.com/cbse/class-12/maths/probability

Q7. 1 mark · Multiple choice

If A and B are disjoint events and P(A | F)=0.3, P(B | F)=0.4, which is P((A∪B) | F)? (A) 0.12 (B) 0.3 (C) 0.4 (D) 0.7

Full answer on SmartKalike: https://smartkalike.com/cbse/class-12/maths/probability

Q8. 2 marks · Short answer

Given P(F)=0.4, P(A∩F)=0.12, P(B∩F)=0.08 and P(A∩B∩F)=0.04, evaluate P((A∪B) | F).

Full answer on SmartKalike: https://smartkalike.com/cbse/class-12/maths/probability

Q9. 3 marks · Medium answer

Each entry of a 2 × 2 determinant is chosen independently and is equally likely to be 0 or 1. Find the probability that the determinant is positive.

Full answer on SmartKalike: https://smartkalike.com/cbse/class-12/maths/probability

Q10. 4 marks · Long answer

A cause is selected from hypotheses E_1, E_2, E_3, which form a partition of S. An event A is then observed. Use Bayes' theorem to obtain a formula for $P(E_2 | A)$, and state what the partition condition implies about how many of E_1, E_2, E_3 occur.

Full answer on SmartKalike: https://smartkalike.com/cbse/class-12/maths/probability



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