Answer on Question #81793 – Math – Statistics and Probability

Question

In an experiment, A and B are events with probabilities P[A] = 5/8 and P[B] = 3/8. Furthermore, A and B are independent. Find P[A ∪ B].

1. 1/8
2. 3/8
3. 7/8
4. 9/64
5. 15/64
6. 25/64
7. 49/64
8. 55/64
9. impossible to determine based on the given information.

Solution

Apply the inclusion-exclusion principle:

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

Since A and B are independent, $P(A \cap B) = P(A)P(B)$. Then

$$P(A \cup B) = P(A) + P(B) - P(A)P(B) = \frac{5}{8} + \frac{3}{8} - \frac{5}{8} \cdot \frac{3}{8} = \frac{49}{64}$$

Answer: option 7. 49/64 is correct.