Answer on Question #58537 – Math – Statistics and Probability

Question

If p(A)=0.5, p(B) = 0.25, and A and B are independent.

- what is value of p(A&B)?

- what is value of p(A|B)?

Notes:

A & B are independent if P(A) = P(A|B)

When A & B are independent, then P(A&B) = P(A) x P(B)

P(A or B) = P(A) + P(B) - p(A+B)

Solution

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Because A and B are independent, we have

$$P(A\&B) = P(A) \cdot P(B) = 0.5 \cdot 0.25 = 0.125.$$

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Then we can write

$$P(A|B) = \frac{P(A\&B)}{P(B)} = \frac{0.125}{0.25} = 0.5.$$

Answer: $P(A\&B) = 0.125; P(A|B) = 0.5.$