Answer on Question #72534, Math / Statistics and Probability

1. Two students A and B can solve 50% and 80% problems are respectively from the exercise. What is the probability that either A or B can solve a problem chosen at random.

Solution

1) Probability that both students can solve

$$= 0.5 \times 0.8 = 0.4$$

Probability that student A can solve and student B cannot solve

$$= 0.5 \times (1 - 0.8) = 0.1$$

Probability that student A cannot solve and student B can solve

$$= (1 - 0.5) \times 0.8 = 0.4$$

Therefore, probability that at least one of them will solve

$$= 0.4 + 0.1 + 0.4 = 0.9$$

2) Probability that both students cannot solve

$$= (1 - 0.5) \times (1 - 0.8) = 0.1$$

Therefore, probability that at least one of them will solve

$$= 1 - 0.1 = 0.9$$

Answer: 0.9.

2. For any events A and B, it is known that P (A) = 2/3, P (A U B) = 7/12 and P (A ∩ B) = 5/12. Find P (B).

Solution

The Inclusion-Exclusion Principle (for two events)

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

Then

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

$$P(B) = \frac{7}{12} - \frac{2}{3} + \frac{5}{12} = \frac{1}{3}$$

Answer: $\frac{1}{3}$.