Answer on Question #53299 - Math - Statistics and Probability

(a) A class has 10 boys and 5 girls. Three students are selected at random one after another. Find the probability that

(i) first two are boys and third is girl;

(ii) first and third are of same sex and the second is of opposite sex.

(b) Two aero planes bomb a target in succession. The probability of each correctly scoring a hit is 0.3 and 0.2 respectively. The second will bomb only if the first misses the target. Find the probability that

(i) target is hit;

(ii) both fails to score hits.

Solution

(a)

(i) Probability that first two are boys and third is girl:

$$P(bbg) = \frac{10}{15} \cdot \frac{9}{14} \cdot \frac{5}{13} = \frac{15}{91}$$

(ii) Probability that first and third are of same sex and the second is of opposite sex:

$$P = P(gbg) + P(gbg) = \frac{10}{15} \cdot \frac{5}{14} \cdot \frac{9}{13} + \frac{5}{15} \cdot \frac{10}{14} \cdot \frac{4}{13} = \frac{5}{21}$$

(b)

(i) Probability that target is hit:

$$P(hit) = 0.3 + 0.7 * 0.2 = 0.44$$

(ii) Probability that both fails to score hits:

$$P(both\ miss) = 0.7 * 0.8 = 0.56$$

Answer:

(a)

(i) $\frac{15}{91}$

(ii) $\frac{5}{21}$

(b)

(i) 0.44

(ii) 0.56