

1. Find the probability of two red from 3 red and 2 blue without replacement.

2. Find $P(A \text{ given } B)$ if $P(A \cap B) = 0.12$ and $P(B) = 0.3$.

3. Find red relative frequency for 18 red results in 60 trials.

4. Use $p = 0.3$ to estimate red count in 200 trials.

5. How many ordered outcomes do two fair dice have?

6. All possible totals of two fair dice are equally likely.
☐ True ☐ False
7. The union count is always the sum of the two set counts without adjustment.
☐ True ☐ False
8. With 18 cycling, 12 swimming and 7 doing both, why is "at least one" 23 rather than 30?
☐ All 30 students do a sport
☐ The overlap must be added twice
☐ Adding $18 + 12$ counts the 7 twice; subtracting the overlap gives $18 + 12 - 7 = 23$
9. $P(A \text{ given } B)$ always equals $P(B \text{ given } A)$.
☐ True ☐ False
10. Mutually exclusive events with positive probabilities must be independent.
☐ True ☐ False

1. **0.3**

Without replacement, $P(RR)=3/5 \times 2/4=0.3$.

2. **0.4**

$P(A|B)=P(A \cap B)/P(B)=0.12/0.3=0.4$.

3. **0.3**

$18/60=0.3$.

4. **60.0**

Expected count= $np=200 \times 0.3=60$.

5. **36.0**

6 choices for the first and 6 for the second: 36.

6. **False**

Counting totals rather than equally likely dice pairs gives wrong weights. State whether order matters. A possibility table lists outcomes; its entries are not automatically equiprobable.

7. **False**

Do not add the overlap twice. Neither is outside both circles, not just outside their overlap. A universal group must be stated before taking a complement.

8. **Adding 18+12 counts the 7 twice; subtracting the overlap gives 18+12-7=23**

The inclusion-exclusion count removes the double-counted overlap once: $18+12-7=23$. Filling the Venn overlap FIRST, then the only-regions, prevents the error.

9. **False**

Given positive and positive given condition are different questions. Use the conditioned group total, not the grand total. A rare starting category can make false-positive counts significant even when the detection rate is high.

10. **False**

Mutually exclusive means no overlap; independent means that knowing one event does not change the other's probability. Two disjoint events with positive probability are not independent.