

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 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?

☐ The overlap must be added twice: $18 + 12 + 7 = 37$ do at least one

☐ Adding $18 + 12$ counts the 7 twice; subtracting the overlap gives $18 + 12 - 7 = 23$

☐ All 30 students do a sport, since $18 + 12 = 30$

9. $P(A \text{ given } B)$ equals $P(B \text{ given } A)$.

☐ True ☐ False

10. Mutually exclusive events with positive probabilities are dependent.

☐ True ☐ False

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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**

A total of 7 has six ways, but 2 has only one, so the totals are not equally likely.

7. **False**

Elements in both sets are counted twice, so subtract the intersection: $n(A \cup B)=n(A)+n(B)-n(A \cap B)$.

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**

The two conditional probabilities have different denominators, so they are usually different.

10. **True**

True. Mutually exclusive events with positive probabilities are dependent: if one happens, the other cannot, so $P(A \text{ and } B)=0 \neq P(A)P(B)$.