Probability

Statistics and probability · 6 questions · step-by-step answers at the end

Name: Date: Score: / 6

USEFUL EQUATIONS

$P(A') = 1 - P(A)$ $P(A \text{ and } B) = P(A) \times P(B)$ $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$

$P(B \text{ given } A) = P(A \text{ and } B)/P(A)$

Questions

Show your working in the space under each question.

1. EASY A fair die is rolled. Find the probability of a prime number.

2. EASY The probability of rain on any day is 0.35. How many rainy days would you expect in 20 days?

3. MEDIUM Two fair dice are rolled. Find the probability that the total is 7.

4. MEDIUM Of 30 students, 18 study French, 15 study Spanish and 8 study both. Find the probability that a student chosen at random studies neither, and that they study French only.

5. HARD For the same students, a French student is chosen at random. Find the probability that they also study Spanish.

6. HARD A bag holds 5 red and 3 green sweets. Three are taken without replacement. Find the probability that all are red, and that at least one is green.

Step-by-step answers

Probability

1. Primes: 2, 3, 5. **3/6 = 1/2**.
2. 0.35 × 20 = **7**.
3. 6 of the 36 outcomes total 7: **6/36 = 1/6**.
4. French or Spanish: 18 + 15 − 8 = 25. Neither: 5, so **5/30 = 1/6**. French only: 10, so **10/30 = 1/3**.
5. Out of 18 French students, 8 also study Spanish: **8/18 = 4/9**.
6. All red: 5/8 × 4/7 × 3/6 = 60/336 = **5/28**. At least one green: 1 − 5/28 = **23/28**.