

AP Statistics - Probability Rules and Simulation - Test

Common Core AP STAT 4.1, AP STAT 4.2, AP STAT 4.3, AP STAT 4.4, HSS-CP.A.1, HSS-CP.B.7 · maths-pdf.fr/en/

Name: _____ Class: _____ Date: ____/____/____

This 45-minute test covers the law of large numbers, sample spaces, the complement and addition rules, Venn diagrams, and simulation. Show the rule you use and write probabilities as fractions or decimals.

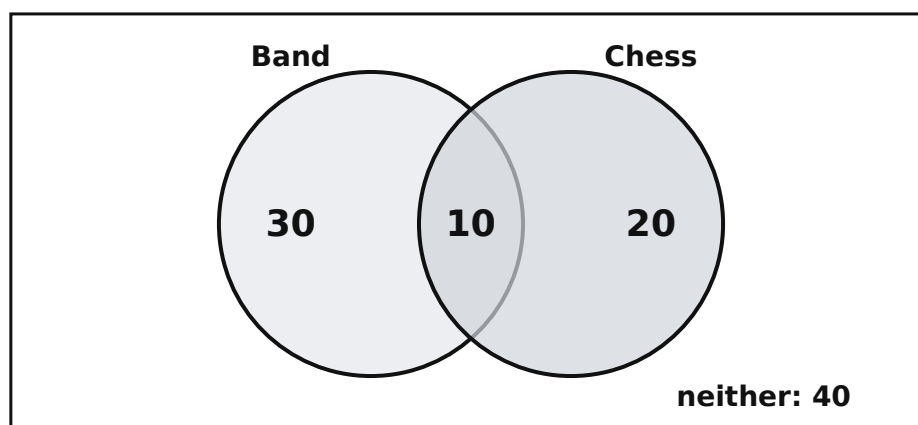
About this test

- Grade: AP Statistics
- Chapter: Probability Rules and Simulation
- Standards: AP STAT 4.1, AP STAT 4.2, AP STAT 4.3, AP STAT 4.4, HSS-CP.A.1, HSS-CP.B.7
- Time: 45 minutes
- Total: 20 points

Question 1 - Interpret a probability [2 pts]

The probability that a certain mobile game level is won is 0.15. Interpret this value in context, and explain whether it means that exactly 15 of every 100 plays are won.

Question 2 - Venn diagram [4 pts]



Students in band and chess.

Use the Venn diagram of 100 students. (a) Find $P(\text{band})$. (1 point) (b) Find $P(\text{band and chess})$. (1 point) (c) Find $P(\text{band or chess})$. (1 point) (d) Are band and chess mutually exclusive? (1 point)

Question 3 - Two dice [3 pts]

+	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

Sample space for two dice: 36 equally likely outcomes.

Two fair dice are rolled. (a) Find $P(\text{sum} = 8)$. (1 point) (b) Find $P(\text{sum is at most 3})$. (1 point) (c) Find $P(\text{sum is not 8})$. (1 point)

Question 4 - Addition rule [2 pts]

For a randomly chosen adult, $P(\text{drinks coffee}) = 0.62$, $P(\text{drinks tea}) = 0.35$, and $P(\text{drinks both}) = 0.18$. Find $P(\text{coffee or tea})$.

Question 5 - Simulation [3 pts]

Random digits
4 8 1 9 6 2 3 7 5 0 2 4 9 1 8 6 3 5 2 7 0 4 1 9 6 3 8 5 2 7

Digits for the simulation.

A game gives a prize with probability 0.4 on each play. Digits 0 to 3 mean a win. Use groups of 3 digits (3 plays) to simulate 10 trials and estimate the probability of at least one win in 3 plays. (3 points)

Question 6 - Complement [2 pts]

The probability that a flight is delayed is 0.27. Find the probability that at least one of two independent flights is not delayed, assuming each is delayed with probability 0.27 and independence. Show the complement rule.

Question 7 - Name the complement [1 pt]

State in words the complement of the event "at least one head in three coin flips."

Question 8 - Law of large numbers [3 pts]

A basketball player has made 5 of her last 6 shots and says she is on a hot streak. Explain, using the law of large numbers, why 5 of 6 is not good evidence that her true percent is above her usual 60%. (3 points)