

Probability Rules, Conditioning and Fair Decisions

Grade 10 – Geometry math · Test · Standards: S-CP.A.1, S-CP.A.2, S-CP.A.3, S-CP.A.4, S-CP.A.5, S-CP.B.6, S-CP.B.7, S-CP.B.8, S-CP.B.9, S-MD.B.6, S-MD.B.7

Name: _____ Date: _____ Class: _____

This test has 8 questions worth 20 points and is designed for 45 minutes. A calculator is allowed. Give fractions or decimals as asked and state the rule you use for each probability.

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Time: 45 minutes · 8 questions · Total: 20 points · Calculator: as allowed by your teacher

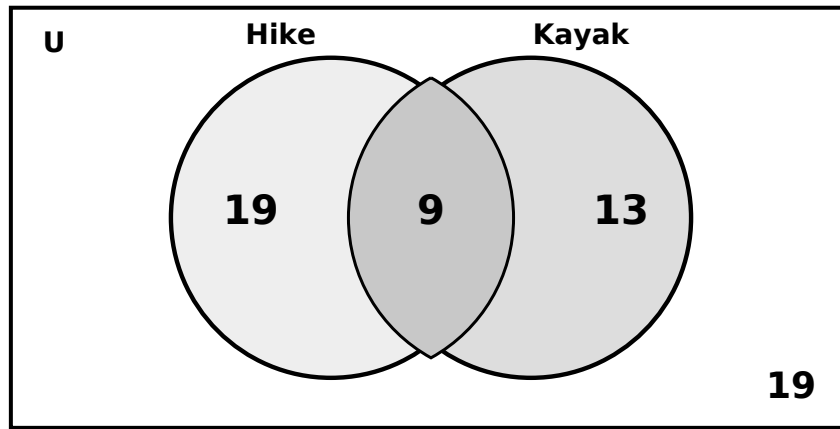
Question 1 Two Dice (2 points)

Die 1	Die 2					
	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

Sums of two dice.

Two fair dice are rolled. Find $P(\text{sum is 10 or more})$ (1 point) and $P(\text{sum is less than 10})$ (1 point).

Question 2 Venn Counts (3 points)



60 people.

In a group of 60 campers, 28 like hiking, 22 like kayaking and 9 like both. Find (a) $P(\text{hiking or kayaking})$, (b) $P(\text{neither})$, (c) $P(\text{kayaking} \mid \text{hiking})$.

Question 3 Two-Way Table (3 points)

	Teens	Adults	Total
Prefers summer	58	47	105
Prefers winter	22	73	95
Total	80	120	200

Find (a) $P(\text{prefers winter})$, (b) $P(\text{prefers winter} \mid \text{adult})$, (c) $P(\text{teen} \mid \text{prefers summer})$. Round to the nearest thousandth.

Question 4 Independent or Not? (2 points)

A school records that half the students ride a bus (A), 40% join a club (B), and 70% do at least one of the two. Calculate the share doing both, then decide if riding the bus and joining a club are independent.

Question 5 Orders and Groups (2 points)

Seven acts reach the finals of a talent show. (a) Count the ways the judges can rank the top three places. (1 point) (b) Count the ways to pick three acts for a showcase with no ranking. (1 point)

Question 6 Marbles Without Replacement (3 points)

A jar holds 6 green marbles and 9 yellow marbles. Two are drawn without replacement. Find (a) $P(\text{both green})$ and (b) $P(\text{the two marbles are different colors})$.

Question 7 A Positive Test (3 points)

A condition affects 4% of people. A test is positive for 90% of people who have it and for 10% of people who do not. A person tests positive. Find the probability that the person has the condition.

Question 8 Fair Spinner Game (2 points)

A spinner has four equal sectors numbered 1 to 4. Anna wins when it lands on 1 or 2 and Ben wins when it lands on 3 or 4. Is the game fair? Then Ben suggests that he wins on 3 only and Anna on 1, 2 and 4. Is that fair?