

Algebra 2 · Probability: Sample Spaces, Independence and Conditional Probability · Quiz

Common Core 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 · mathovore.fr

Name: _____ Date: ____/____/____ Score: _____

This algebra 2 probability rules quiz asks 10 multiple-choice questions on probability: sample spaces, independence and conditional probability, and each answer comes with a short explanation.

Answer these 10 multiple-choice questions on probability: complements, the addition rule, independence, conditional probability, two-way tables and tree diagrams. Pick one answer for each question, then read the explanations to see the common mistakes.

Algebra 2 Common Core: 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

Questions

Question 1

The probability of rain tomorrow is 0.28. What is the probability that it does not rain?

- A. 0.28
- B. 0.72
- C. 0.62
- D. 0.78

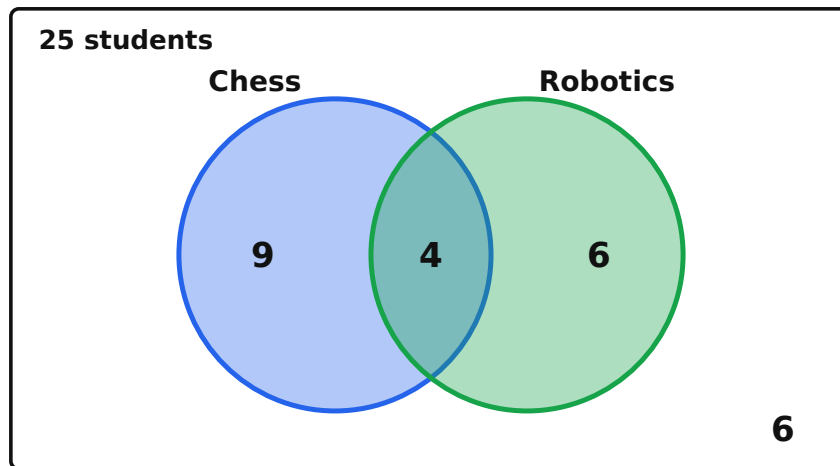
Question 2

$P(A)=0.5$, $P(B)=0.4$ and $P(A \text{ and } B)=0.15$. What is $P(A \text{ or } B)$?

- A. 0.9
- B. 0.75
- C. 0.65
- D. 0.2

Question 3

A student is chosen at random. What is the probability that the student is in chess or robotics?



Venn diagram for quiz question 3.

- A. $\frac{23}{25}$
- B. $\frac{4}{25}$
- C. $\frac{19}{25}$
- D. $\frac{6}{25}$

Question 4

Events A and B are independent, $P(A)=0.2$ and $P(B)=0.5$. What is $P(A \text{ and } B)$?

- A. 0.7
- B. 0.3
- C. 0.1
- D. 0.25

Question 5

What is $P(\text{pizza}|\text{grade } 7)$?

	Grade 6	Grade 7	Total
Pizza	18	28	46
Tacos	12	42	54
Total	30	70	100

Table for quiz question 5.

- A. $\frac{2}{5}$
- B. $\frac{7}{25}$
- C. $\frac{14}{25}$
- D. $\frac{23}{50}$

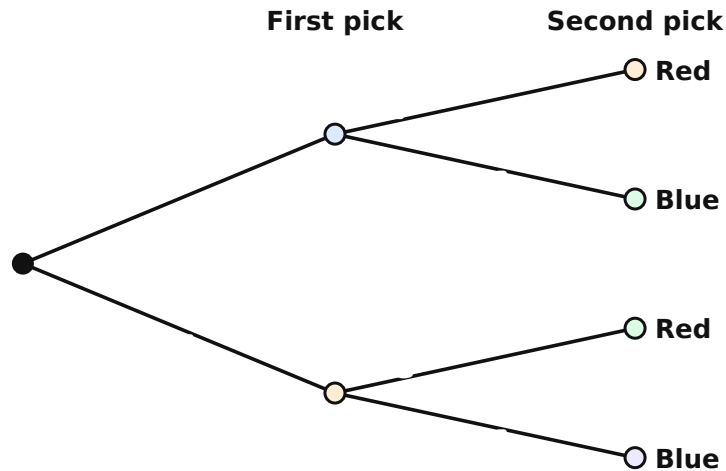
Question 6

$P(A \text{ and } B) = 0.18$ and $P(B) = 0.6$. What is $P(A|B)$?

- A. 0.3
- B. 0.108
- C. 0.42
- D. 0.78

Question 7

Two marbles are drawn without replacement. What is the probability that both are blue?



Tree for quiz question 7.

- A. $\frac{9}{25}$
- B. $\frac{5}{10}$
- C. $\frac{1}{10}$
- D. $\frac{3}{10}$

Question 8

$P(A) = 0.4$, $P(B) = 0.25$ and $P(A \text{ and } B) = 0.10$. Which statement is true?

- A. The events are independent because $0.4 \cdot 0.25 = 0.10$.
- B. The events are not independent because $0.4 + 0.25 \neq 0.10$.
- C. The events are independent because 0.10 is less than 0.25.
- D. The events are not independent because $P(A \text{ and } B)$ is not 0.

Question 9

Two fair dice are rolled. What is the probability that the sum is 9?

- A. $\frac{1}{12}$
- B. $\frac{1}{6}$
- C. $\frac{1}{4}$

D. $\frac{1}{9}$

Question 10

Events A and B are mutually exclusive, $P(A)=0.3$ and $P(B)=0.45$. What is $P(A \text{ or } B)$?

- A. 0.135
- B. 0.75
- C. 0.15
- D. 0.85

Answer key

1. **B** - The complement rule gives $1 - 0.28 = 0.72$.
2. **B** - $0.5 + 0.4 - 0.15 = 0.75$. Forgetting to subtract the overlap gives 0.9.
3. **C** - Chess or robotics $= 9 + 4 + 6 = 19$ students out of 25. Adding $13 + 10 = 23$ counts the overlap twice.
4. **C** - For independent events multiply: $0.2 \cdot 0.5 = 0.1$. Adding probabilities is the usual mistake.
5. **A** - Use the grade 7 column only: $\frac{28}{70} = \frac{2}{5}$. Dividing by 100 or by the pizza total answers a different question.
6. **A** - $P(A|B) = \frac{0.18}{0.6} = 0.3$. Multiplying gives 0.108, which is not a conditional probability.
7. **D** - Multiply along the blue-blue path: $\frac{3}{5} \cdot \frac{2}{4} = \frac{3}{10}$. Using $\frac{3}{5}$ twice ignores that a marble was removed.
8. **A** - Independence means $P(A \text{ and } B) = P(A)P(B)$, and $0.4 \cdot 0.25 = 0.10$. Being nonzero does not rule out independence.
9. **D** - The sum is 9 for $(3,6), (4,5), (5,4), (6,3)$, so $\frac{4}{36} = \frac{1}{9}$.
10. **B** - Mutually exclusive means no overlap, so add: $0.3 + 0.45 = 0.75$. Multiplying is for independent events.

How does this quiz work?

Read each question, choose one answer among A, B, C and D, then check it: a short explanation appears after every answer. Your score out of 10 is shown at the end, and you can restart the quiz as often as you like.

What should you review before the quiz?

Reread the key facts of the lesson and the worked example. If a question is hard, go back to the matching part of the lesson, then try the quiz again. Write your work on scrap paper: most mistakes come from skipping a step, not from the idea itself.

Remember:

- Standards S-CP.A.1 to S-CP.A.5, S-CP.B.6 and S-CP.B.7: events, independence, conditional probability and the addition rule.
- Complement rule: $P(\text{not } A) = 1 - P(A)$.
- Addition rule: $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$; subtract the overlap once.
- Conditional probability: $P(A|B) = \frac{P(A \text{ and } B)}{P(B)}$, the fraction of B that is also in A .
- Test independence by checking $P(A \text{ and } B) = P(A) \cdot P(B)$ or $P(A|B) = P(A)$.

How to use this algebra 2 probability rules quiz

Retake this algebra 2 probability rules quiz until every answer is right, then move on to the worksheet and the test.

