LESSON MAKER PRO

Multiply the Odds

Find the probability that both events happen.

HIGH SCHOOL · MA.912.DP.4.8

MA.912.DP.4.8 "Apply the general multiplication rule for probability, taking into consideration whether the events are independent, and interpret the result in terms of the context."

NAME _____ DATE _____

MULTIPLY FOR BOTH

To find the probability of both events, multiply the probabilities. For independent events, the second probability stays the same. For dependent events, update the second probability after the first event happens.

WORKED EXAMPLE

A music app picks a favorite song with probability 7/13. Independently, a game gives a bonus with probability 5/11. What is the probability of both?

1. The events are independent.
2. Multiply: 7/13 x 5/11.
3. Multiply: 35/143.

Answer: 35/143

PRACTICE 5 problems

1 Events A and B are independent. P(A) = 3/8 and P(B) = 4/9. Find P(A and B).

ANSWER _____

2 A bag has 4 orange and 6 purple tiles. Draw an orange tile, replace it, then draw another orange tile. Find the probability.

ANSWER _____

3 A bag has 4 orange and 6 purple tiles. Draw an orange tile, do not replace it, then draw a purple tile. Find the probability.

ANSWER _____

4 Roll a standard die twice. Find the probability of rolling an even number first and a number greater than 4 second.

ANSWER _____

5 A bag has 6 red and 4 blue tiles. Draw two tiles without replacement. Find P(blue, then red).

ANSWER _____

APPLY IT Show your work

1 An esports player has a 1/4 chance to win each match. The match results are independent. What is the probability the player wins the first two matches?

WORK SPACE

ANSWER _____

2 At a volunteer event, 6 of 10 open spots are for stage crew. Two students are assigned without replacement. What is the probability that both students are assigned to stage crew?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A sneaker raffle bin contains 3 black, 4 white, and 2 gray prize cards. Three cards are drawn without replacement. Find the probability of drawing black, then white, then gray. State whether the events are independent or dependent.

WORK SPACE AND ANSWER

ANSWER KEY

Multiply the Odds

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Events A and B are independent. P(A) = 3/8 and P(B) = 4/9. Find P(A and B).	**1/6**
2	A bag has 4 orange and 6 purple tiles. Draw an orange tile, replace it, then draw another orange tile. Find the probability.	**4/25**
3	A bag has 4 orange and 6 purple tiles. Draw an orange tile, do not replace it, then draw a purple tile. Find the probability.	**4/15**
4	Roll a standard die twice. Find the probability of rolling an even number first and a number greater than 4 second.	**1/6**
5	A bag has 6 red and 4 blue tiles. Draw two tiles without replacement. Find P(blue, then red).	**4/15**

PART 2 · APPLY IT

1. **1/16** Multiply 1/4 x 1/4 because each match has the same win probability. The probability of two wins is 1/16.
2. **1/3** The events are dependent because one stage-crew spot is removed after the first assignment. Multiply 6/10 x 5/9 to get 1/3.

CHALLENGE

1/21; dependent

Accept equivalent fractions. For dependent events, accept correct work that updates the total number of items after each draw.