

Name \_\_\_\_\_

Date \_\_\_\_\_

## Multiplication Rule of Probability - Guided Lesson Explanation

### Explanation#1

Let A = the event that the first marble is blue; and let B = the event that the second marble is blue. We know the following:

In the beginning, there are 10 marbles in the box, 7 of which are blue. Therefore,  $P(A) = 7/10$ .

After the first selection, there are 9 marbles in the box, 6 of which are blue. Therefore,  $P(B|A) = 6/9$ .

Therefore, based on the rule of multiplication:

$$P(A \cap B) = P(A) P(B|A)$$

$$P(A \cap B) = (7/10) * (6/9)$$

$$= 42/90$$

$$= 7/15$$

So, the answer is 7/15.

### Explanation#2

Using the multiplication rule we get

$$P(\text{queen}) \times P(\text{jack}) = (4/52)(4/51)$$

$$= 16/2652$$

$$= 4/663$$

So, the answer is 4/663.



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### Explanation#3

As per the conditions of multiplication rule we need to find

$$P(\text{brown}) \times P(\text{yellow}).$$

$$P(\text{brown}) = 5/20$$

$$P(\text{yellow}) = 4/20$$

$$P(\text{brown/yellow}) = (5/20)(4/20)$$

$$= 20/400$$

$$= 1/20$$

The events in this example were independent. Once the first paper was picked out and its color recorded, it was not returned to the folder. Therefore, the probability for the second paper was affected by what happened on the first paper.

So, the answer is 1/20.

