

A drawer contains 3 white balls and 6 black balls. Two balls are drawn out of the box at random. What is the probability that they both are white?

Original Text

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To find the probability that both balls drawn are white, we can use the concept of probability without replacement.

1. **Calculate the total number of ways to draw 2 balls from 9 balls**:  
The total number of ways to choose 2 balls from 9 is given by the combination formula  $\binom{n}{k} = \frac{n!}{k!(n-k)!}$ , where  $\binom{n}{k}$  is the  
total number of items to choose from, and  $k$  is the number of items to choose.  

$$\binom{9}{2} = \frac{9!}{2!(9-2)!} = \frac{9 \times 8}{2 \times 1} = 36$$


2. **Calculate the number of ways to draw 2 white balls from 3 white balls**:  
Similarly, the number of ways to choose 2 white balls from 3 is:  

$$\binom{3}{2} = \frac{3!}{2!(3-2)!} = \frac{3 \times 2}{2 \times 1} = 3$$


3. **Calculate the probability that both balls drawn are white**:  
The probability that both balls drawn are white is the ratio of the number of favorable outcomes to the total number of outcomes:  

$$P(\text{both white}) = \frac{\text{Number of ways to choose 2 white balls}}{\text{Total number of ways to choose 2 balls}} = \frac{3}{36} = \frac{1}{12}$$


Therefore, the probability that both balls drawn are white is  $\frac{1}{12}$ .
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Perturbed Text

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To find the probability that both balls drawn are white, we can use the concept of probability without replacement.

1. **Calculate the total number of ways to draw 2 balls from 9 balls**:  
The total number of ways to choose 2 balls from 9 is given by the combination formula  $\binom{n}{k} = \frac{n!}{k!(n-k)!}$ , where  $\binom{n}{k}$  is the  
total number of items to choose from, and  $k$  is the number of items to choose.  

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Similarly, the number of ways to choose 2 white balls from 3 is:  

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3. **Calculate the probability that both balls drawn are white**:  
The probability that both balls drawn are white is the ratio of the number of favorable outcomes to the total number of outcomes:  

$$P(\text{both white}) = \frac{\text{Number of ways to choose 2 white balls}}{\text{Total number of ways to choose 2 balls}} = \frac{3}{36} = 0.12$$


Therefore, the probability that both balls drawn are white is  $0.12$ .
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