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7.SP.C.8 Solve Probability of Compound Events

7.SP.C.8 Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.

1. Two urns each contain blue balls and yellow balls. Urn I contains 3 blue balls and 4 yellow balls and Urn II contains 5 blue balls and 6 yellow balls. A ball is drawn from each urn. What is the probability that both balls are blue?

   [A] $\dfrac{24}{77}$ [B] $\dfrac{15}{77}$ [C] $\dfrac{8}{77}$ [D] $\dfrac{10}{77}$

2. Three students are chosen at random. Find the probability that all three were born on Wednesday.

   [A] $\dfrac{1}{21}$ [B] $\dfrac{3}{7}$ [C] $\dfrac{3}{365}$ [D] $\dfrac{1}{343}$

3. A bag contains 2 yellow marbles and 5 red marbles. Two marbles are drawn at random. One marble is drawn and not replaced. Then a second marble is drawn. What is the probability that the first marble is red and the second one is yellow?

   [A] $\dfrac{5}{2}$ [B] $\dfrac{1}{5}$ [C] $\dfrac{5}{21}$ [D] $\dfrac{5}{42}$

4. A drawer contains 5 red socks, 7 white socks, and 4 blue socks. Without looking, you draw out a sock and then draw out a second sock without returning the first sock. What is the probability that the first sock and the second sock are both red?

   [A] $\dfrac{1}{16}$ [B] $\dfrac{1}{20}$ [C] $\dfrac{1}{12}$ [D] $\dfrac{25}{256}$

5. Four cards are drawn at random without replacement from a standard deck of 52 cards. Find P(4 diamonds).

   [A] $\dfrac{1}{256}$ [B] $\dfrac{11}{4,165}$ [C] $\dfrac{4}{13}$ [D] $\dfrac{1}{13}$

6. The probability of rain on Monday is 0.1. The probability of rain on Tuesday is 0.8. What is the probability of rain on both Monday and Tuesday?

7. In a game, you choose a card from a box containing 4 red cards, 6 blue cards, and 5 yellow cards. You replace the first card in the box and then choose again. What is the probability of choosing a red or blue card and then choosing a blue or yellow card?

8. A coin is tossed and a die is rolled. What is the probability that the coin shows tails and the die shows a 3?

9. A coin is tossed and a number cube is rolled. What is the probability that the coin shows heads and the number cube shows an odd number?

10. Two urns each contain green balls and yellow balls. Urn I contains three green balls and three yellow balls and Urn II contains five green balls and five yellow balls. A ball is drawn from each urn. What is the probability that both balls are yellow?

11. In a game, you choose a card from a box containing 4 red cards, 6 blue cards, and 5 yellow cards. You do not replace the first card in the box before choosing again. What is the probability of choosing a blue card and then choosing a yellow card?

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12. A and B are independent events.

    $P(B) = \dfrac{5}{6}$, $P(A \text{ and } B) = \dfrac{1}{3}$. Find $P(A)$.

    [A] $\dfrac{23}{9}$ [B] $\dfrac{2}{15}$ [C] $\dfrac{2}{5}$ [D] $\dfrac{5}{18}$

13. A and B are independent events.

    $P(A) = \dfrac{2}{3}$, $P(A \text{ and } B) = \dfrac{2}{7}$. Find $P(B)$.

14. Compare the quantities in Column A and Column B.

Column A	Column B
$P(B)$ if A and B are independent,	$P(B$ after $A)$ if A and B are dependent,
$P(A \text{ and } B) = \dfrac{1}{4}$, and $P(A) = \dfrac{1}{2}$.	$P(A) = \dfrac{1}{2}$.

    [A] The quantity in Column A is greater.   [B] The quantity in Column B is greater.

    [C] The quantities are equal.

    [D] The relationship cannot be determined from the information given.

15. In a game using the chart below, you earn points if you toss heads in accordance with choice A, B or C. If you choose A and you toss two heads, you earn four points. If you choose B and toss two heads and a tail, you earn zero points. Each choice you make counts as one turn. How would you use the probability of tossing consecutive heads to determine the choice of A, B or C to earn points, while taking the lowest number of turns?

All Heads	Points Given
(A) 2 tosses	4
(B) 3 tosses	6
(C) 4 tosses	10

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[1] B

[2] D

[3] C

[4] C

[5] B

[6] 0.08

[7] $\dfrac{22}{45}$

[8] $\dfrac{1}{12}$

[9] $\dfrac{1}{4}$

[10] $\dfrac{1}{4}$

[11] $\dfrac{1}{7}$

[12] C

[13] $\dfrac{3}{7}$

[14] D