

Chapter 10: Independent and Dependent Events

Problems 1-14 ask whether the event is a dependent event with independent event, then calculate.

1. You roll a die and flip a coin. What is the probability of getting a 1 and a head?

$$P(A \cap B) = \frac{1}{6} \cdot \frac{1}{2} = \frac{1}{12}$$
2. You have a bag of 10 red marbles and 10 yellow marbles. You pull a marble out of the bag without putting it back. What is the probability of getting a yellow and then a red?

$$P(A \cap B) = \left[\frac{10}{20} \right] \cdot \left[\frac{10}{19} \right] = \frac{100}{380} = \frac{10}{38}$$
3. A person rolls a 6-sided die and a 4-sided number cube. There are standard 6-sided sides. What is the probability that they will roll a five on the number cube and a number greater than 4 on the die?

$$P(A \cap B) = \frac{1}{4} \cdot \frac{2}{6} = \frac{2}{24} = \frac{1}{12}$$
4. There are 1000 people in a town. The population grows 10% each year. How many people will there be in 5 years?

$$P(A \cap B) = \left(\frac{1000}{100} \right) \cdot \left(\frac{110}{100} \right)^5 = \frac{1000}{100} \cdot \frac{161051}{100000} = 1610.51$$
5. You are drawing cards from a deck of 52 cards. You will draw two cards and not put the first card back. What is the probability that you will draw a red card and a king?

$$P(A \cap B) = \frac{26}{52} \cdot \frac{2}{51} = \frac{52}{2652} = \frac{1}{51}$$
6. The game of rock, paper, scissors is played with two players, P, W, T, P, and T each. You roll an eight-sided die to determine the first randomly die face. What is the probability that the spinner will stop on 8 or 10 and the die is a prime number?

$$P(A \cap B) = \frac{2}{8} \cdot \frac{2}{6} = \frac{4}{48} = \frac{1}{12}$$
7. A die is rolled and a coin is flipped. What is the probability that the spinner will stop on 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 and the coin will be heads?

$$P(A \cap B) = \frac{1}{12} \cdot \frac{1}{2} = \frac{1}{24}$$
8. What is the probability that the spinner will stop on 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 and the coin will be tails?

$$P(A \cap B) = \frac{1}{12} \cdot \frac{1}{2} = \frac{1}{24}$$
9. What is the probability that the spinner will stop on 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 and the coin will be heads or tails?

$$P(A \cap B) = \frac{1}{12} \cdot \frac{2}{2} = \frac{2}{12} = \frac{1}{6}$$
10. You are drawing cards from a deck of 52 cards. You will draw two cards and not put the first card back. What is the probability that you will draw a queen followed by a queen?

$$P(A \cap B) = \left[\frac{4}{52} \right] \cdot \left[\frac{3}{51} \right] = \frac{12}{2652} = \frac{1}{221}$$
11. The number of the hour and other parts show you close all 24 hours. What is the probability that the hour will be closer to 1 by being between 1 and 2?

$$P(A \cap B) = \frac{2}{24} = \frac{1}{12}$$

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Sup $\frac{2}{24} = \frac{1}{12}$ $\frac{25}{24} = \frac{25}{24}$