How Can Probability Help Us Make Smarter Decisions In Life?

Brinly 8-7

**Introduction**

Thinking of probability, everyone might groan and moan. It’s one of the most frustrating and painful topics in math studying for middle schoolers. You might say, isn’t probability just ? Well, partially.

**Definition**

Probability is defined as the likelihood that a particular event will happen. The probability of an event is a number between and inclusive. For example, what is the probability of choosing a spade in a deck of 52 cards? The answer is.

From this question, a formula can be derived: = . However, in order to fully understand probability, we need to explore some key formulas and concepts that help us determine the likelihood of different events. The following probability formulas and definitions can help us solve a wide range of probability problems.

**Complementary Probability**

Sometimes, it’s easier to find the probability of something not happening. The complement of an event is the probability that it does not occur. The formula is:

(Where A represents the probability that event does not happen).

**Conditional Probability**

Conditional probability refers to the probability of an event occurring given that another event has already occurred. This is important for understanding the relationship between two events, especially when one affects the other.

The formula for conditional probability is:

(Where  represents the probability of event A occurring given that event B has already occurred).

**Independent Events**

Two events are independent if the occurrence of one event does not affect the occurrence of the other. For independent events A and B, the formula is:

(If events are independent, the probability of both happening is the product of their individual probabilities).

**Dependent Events**

For dependent events, the outcome of one event affects the probability of the other. For dependent events A and B, the formula is:

(If events are dependent, the probability of both happening is the product of the probability of event A occurring and the probability of event B occurring dependent on A, which is also the conditional probability).

**Example Problem**

To better understand these concepts, let’s revisit our earlier example of a deck of 52 cards. Suppose we want to know the probability of drawing a spade first, and then drawing another spade without replacement. Since the first draw affects the second, these events are dependent.

**Solution:**

Probability of drawing a spade first:

Probability of drawing another spade given that the first card was a spade:

Using the formula for dependent events:

After learning these key formulas, what is the role of probability in real life?

**Probability in Real Life**

There are two fields involved: financial and everyday life. Probability can determine the possible performance of a stock and can help investors prevent huge losses. Everyday life examples include weather forecasting, which is among the most well known. Meteorologists use expensive equipment to understand the likelihood of weather events. They look at historical data, combine it with current trends, and determine the chances of rain (for example) occurring on a certain day. This leads to the conclusion that, for instance, there is a 60% chance of rain. Probability can also be used to predict sports events. By looking at the scoring percentage of a certain basketball player, probability can be used to estimate the number of points they will score in the next game. Last but not least, insurance companies use probability to calculate the likelihood of an event such as a road accident. They use this probability to decide wether money could be made.

To sum up, probability is an annoying but fascinating field that can be incredibly fun and interesting to study. The future can be predicted and broken down using this mathematical method.

**Practice Problems to Test Yourself**

（The answers will be revealed in the next article, so please subscribe to our account!）

1. A fair six-sided dice is rolled. What is the probability of rolling a number less than 5?

2. A fair six-sided dice is rolled. What is the probability of rolling an even prime number?

3. Two fair six-sided die are rolled. What is the probability that their sum is greater than 4?

4. A jar contains 12 marbles: 4 red, 5 blue, and 3 orange. If you randomly pull three marbles from the jar without replacement, what is the probability of getting all three colors in the specific order of blue, orange, and red?

概率如何帮助我们在生活中更聪明？

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**简介**

想到概率，大家可能会唉声叹气。这是中学生数学学习中最让人沮丧和 痛苦的话题之一。你可能会说，概率不就是

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| --- |
| 选中的结果 总的可能数量  好吧，部分可能是这样。  **定义** |
| 概率被定义为某一特定事件发生的可能性。一个事件发生的概率是一个介 于 0 到 1 之间的数字。例如，在一副 52 张牌中选择一张黑桃的概率是多少?答 案是 |
| 从这个问题，可以推导出一个公式:P(A)= 选中的结果 总的可能数量  然而，为了充分理解概率，我们需要探索一些关键的公式和概念，这些公式 和概念可以帮助我们确定不同事件的可能性。下面的概率公式和定义可以帮助 我们解决各种各样的概率问题。  **互补概率**  有时候，找到某件事不发生的概率更容易。一个事件的补语就是它不发 生的概率。公式为:  P(A)=1-P(A) (其中 A 表示事件不发生的概率) |

**条件概率**

条件概率指的是在另一个事件已经发生的前提下，一个事件发生的概

率。这对于理解两个事件之间的关系很重要，尤其是当一个事件影响另一个 事件时。

条件概率的公式是:

(其中 P A  B)表示在事件 B 已经发生时，事件 A 的概率）

**独立事件**

如果一个事件的发生不影响另一个事件的发生，则两个事件是独立的。 对于独立事件 A 和 B，公式为:

P(An B)=P(A)XP(B)(如果事件是独立的，则两者发生的概率是它 们各自概率的乘积)。

**相关事件**

|  |
| --- |
| 对于相关事件，一个事件的结果会影响另一个事件的概率。对于相关事 件 A 和 B，公式为: |
| (如果 A 事件的发生是相关的，并且概率 B 事 件同时发生的概率依赖于 A，这也是条件概率)。  **例题** |
| 为了更好地理解这些概念，让我们回顾一下之前的 52 张牌的例子。假设 我们想知道先抽一张黑桃，然后再抽一张黑桃而不替换的概率。由于第一次抽 到会影响第二次抽到，所以这些事件是相关的。  **解法:** |
| 先抽到黑桃的概率: P(A)= 13/52  假设第一张牌是黑桃，再抽到黑桃的概率:P(B | A)= 12/51 使用依赖事件的公式: |



学了这些公式，那么在实际生活中概率有哪些作用？

**现实生活中的概率**

这涉及到两个领域:金融和日常生活。概率可以决定一只股票可能的表现，可 以帮助投资者避免巨额损失。 日常生活中的例子包括天气预报，这是最广为人 知的。气象学家使用昂贵的设备来了解天气事件的可能性。他们查看历史数

据，将其与当前趋势相结合，并确定(例如)某一天发生降雨的可能性。这就得 出了这样的结论，比如，下雨的几率是60%。概率也可以用来预测体育赛事。

通过观察某个篮球运动员的得分百分比，概率可以用来估计他们在下一场比赛 中会得到多少分。最后但并非最不重要的是，保险公司用概率来计算道路交通 事故等事件发生的可能性。他们用这个概率来决定是否能赚钱。

总而言之，概率是一个令人讨厌但迷人的领域，研究它可以非常有趣和有 趣。用这种数学方法可以预测和分解未来。

**练习问题来测试自己**

(答案将在下一篇文章中揭晓，欢迎订阅我们的账号!)

1. 掷出一个公平的六面骰子。摇到一个小于 5 的数字的概率是多少?

2. 掷出一个公平的六面骰子。摇到偶数素数的概率是多少?

3. 掷两个均匀的六面骰子。它们的和大于 4 的概率是多少?

4. 一个罐子里有 12 颗弹珠:4 颗红色，5 颗蓝色，3 颗橙色。如果你从罐子里 随机取出三颗弹珠，不更换，那么按照蓝、橙、红的特定顺序得到三种颜色的

概率是多少?