Probability Scenario Equations with Work Shown

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In all of the probability scenarios listed below, the following probability equation will be used:

n(A) / n(S) = P(A)

* P(A) is the probability of an event “A”
* n(A) is the number of experimental outcomes
* n(S) is the total number of outcomes in the experiment
  1. Rolling a die and having a number greater than 5.

A die has six sides, each side with a number 1-6. The prompt wants to know the probability of rolling anything higher than a 5, meaning a 6 only, as that is the only number on the die higher than a 5. The probability equation is the number of experimental instances (rolling a 6, which is only one instance) divided by the total number of instances (1, 2, 3, 4, 5, and 6 are all available instances on a die, so that equals six instances). The answer would be 0.1666667 or a 1 in 6 chance. The mathematical equation is as follows:

n(A) = 1, n(S) = 6, 1 / 6 = **0.166667** = P(A)

* 1. Rolling a die and return a 6.

This scenario is the exact same scenario as the previous one, just iterated in simpler terms. This means that the same answer as above is also the answer here.

n(A) = 1, n(S) = 6, 1 / 6 = **0.166667** = P(A)

* 1. Selecting a card from a standard pack of cards that is Red.

A standard pack of cards has fifty-two cards, not including jokers which are playable in only certain types of games. There are four suits in each standard deck, containing thirteen cards each, and the suits are either black or red in color. Clubs and spades are black, and hearts and diamonds are red. This means that there are twenty-six possible cards that are red within a standard fifty-two-card deck. The equation for the scenario reads like this:

n(A) = 26, n(S) = 52, 26 / 52 = **0.5** = P(A)

* 1. Selecting a card from a standard pack of cards that is an Ace.

Similar to the scenario above, the experimental outcome we are looking for here is an Ace, which is present one time within each suit, making for a total of four Aces (Ace of Hearts, Ace of Spades, Ace of Clubs, and Ace of Diamonds) in a standard fifty-two-card deck. With the number of experimental outcomes being four and the total number of outcomes being fifty-two, the equation reads as below:

n(A) = 4, n(S) = 52, 4 / 52 = **0.076923** = P(A)

* 1. Flipping a coin and getting Heads.

A coin has two sides, heads and tails. As we are looking to flip heads, that is only one experimental outcome, while the total number of outcomes is only two (heads or tails). The answer is down below:

n(A) = 1, n(S) = 2, 1 / 2 = **0.5** = P(A)