Objective: In this lesson, you will describe events as subsets of a sample space (the set of outcomes).

Click and read the knowledge article. Answer the following.

**sample space** - 

An event is defined as a 

When flipping a coin:

What are the three outcomes a heads occurs at least once? 

How many possibilities will tails occur twice? 

When rolling a dice, there are outcomes.

If we were to roll the die 3,000 times, it is likely that a 2 would occur 

probability of an event occurring: first identify the number of outcomes favorable to the event, \( n(E) \), and then divide this number by the total number of outcomes in the sample space, \( n(S) \):

\[
P(E) = \frac{n(E)}{n(S)}
\]

From the tree diagram, we know that when the spinner is spun twice, the sample space consists of 

When the spinner is spun three times, the sample space consists of 

If the number of sample outcomes of a single stage of an experiment is \( a \), the total number of elements in the sample space of \( n \) stages is \( a^n \).

How many possible outcomes are there for a 3 digit passcode? 

What is the probability of randomly guessing the passcode? 

How many possible outcomes are there for a 3 digit passcode, if no digit repeats? 

What are the chances of randomly guessing the passcode if no digit is repeated? 

Geometry B
Unit 4 – Sample Space

Example
If a spinner divided into 2 sections is spun 5 times, how many outcomes are possible? ________________

The probability of an event is 1, or 100%, if the event covers ____________________________________________

When the probability is 0, there are _________________________________________________________________

Example
A card is drawn at random from a well-shuffled deck of playing cards. What is the probability that the card drawn shows a number from 4 to 9 (inclusive of these two numbers)?

Card info:

- 52 cards in a deck
- 4 suites (clubs, spades, hearts, diamonds)
- each suit has a Ace, 2, 3, 4, 5, 6, 7, 8, 9, 10, jack, queen, king

______________________________

Mutually exclusive events have no common outcomes.

What is the probability a card drawn is a face card or an even-numbered card?

\[
\frac{3 \text{ face cards} \times 4 \text{ suits}}{52 \text{ cards}} + \frac{5 \text{ even cards} \times 4 \text{ suits}}{52 \text{ cards}} = __________________________
\]

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nonexclusive events and their intersection

What is the probability of picking a club or a queen?

13 clubs, 4 queens