An Exam P Study Guide

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2019-12-22

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Chapter 1

An Introduction to Set Theory

1.1 Defining Sets

Sets are collections of objects. Usually objects are placed inside curly braces and separated by commas. Here is the set with the numbers 1 and 2. We often give sets a name. This set is named "A".

$$A = \{1, 2\}$$

Objects inside the curly braces are called elements of the set. There is a special character that means "is an element of". Using our notation we can say that 1 is an element of A.

$$1 \in A$$

We can also say that 3 is not an element of A by drawing a slash through our symbol.

$$3 \notin A$$

We can define sets in a something called set-builder notation. Set builder notation is useful for infinite sets or sets that are hard to enumerate. Below are some examples.

We can define the even numbers as $\{x | x \textit{ is an even number}\}$

We can define hands of cards as $\{x | x \textit{ is a } 5 \textit{ element subset of a deck of cards}\}$

To read set builder notation we translate the "|" as "where". So the real numbers are "the set of x where x is a real number".