CS 3530: Assignment 0b

Fall 2023

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Exercise 0.1def (6 points)

Problem

Examine the following formal descriptions of sets so that you understand which members they contain. Write a short informal English description of each set.

    d. $\{n|n = 2m$ for some m in $\mathbb{N}$, and $n = 3k$ for some k in $\mathbb{N}\}$

    Solution

    A set of all numbers within $\mathbb{N}$ which are divisible by both 2 and 3.

    e. $\{w|w$ is a string of 0s and 1s and w equals the reverse of $w\}$

    Solution

    A set of bit strings which are the same forward and back.

    f. $\{n|n$ is an integer and $n = n + 1\}$

    Solution

    Set of all integers which are one greater than n.

Exercise 0.2b (2 points)

Problem

Write formal descriptions of the following sets.

    b. The set containing all integers that are greater than 5.

    Solution

    $\{6, 7, 8, ...\}$

Exercise 0.3abcdef (12 points)

Problem

Let A be the set $\{x, y, z\}$ and B be the set $\{x, y\}$.

    a. Is A a subset of B?

    Solution

    No, A contains item z while B does not.

b. Is B a subset of A?

Solution

Yes, Everything inside B is also inside A.

c. What is $A \cup B$?

Solution

$\{x, y, z\}$

d. What is $A \cap B$?

Solution

$\{x, y\}$

e. What is $A \times B$?

Solution

$\{(x, x), (x, y), (y, x), (y, y), (z, x), z, y)\}$

f. What is the power set of B?

Solution

$\{null, \{x\}, \{y\}, \{x, y\}\}$