CS 3530: Assignment 0c

Fall 2022

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Exercise 0.6abcde (10 points)

Problem

Let X be the set $\{1, 2, 3, 4, 5\}$ and Y be the set $\{6, 7, 8, 9, 10\}$. The unary function $f : X \to Y$ and the binary function $g : X \times Y \to Y$ are described in the following tables.

n	$f(n)$
1	6
2	7
3	6
4	7
5	6

g	6	7	8	9	10
1	10	10	10	10	10
2	7	8	9	10	6
3	7	7	8	8	9
4	9	8	7	6	10
5	6	6	6	6	6

a. What is the value of $f(2)$?

Solution

7

b. What are the range and domain of f?

Solution

Range: {6, 7} Domain: {1, 2, 3, 4, 5, 6}

c. What is the value of $g(2, 10)$?

Solution

6

d. What are the range and domain of g?

Solution

range: {6, 7, 8, 9, 10} domain: { (1,6), (1,7), (1,8), (1,9), (1,10),(2,6), (2,7), (2,8), (2,9), (2,10),(3,6), (3,7), (3,8), (3,9), (3,10),(4,6), (4,7), (4,8), (4,9), (4,10),(5,6), (5,7), (5,8), (5,9), (5,10)}

e. What is the value of $g(4, f(4))$?

Solution

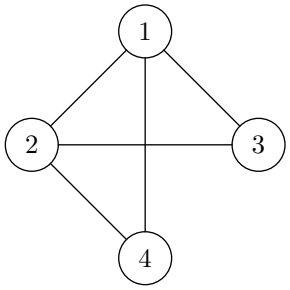
8

Exercise 0.8 (5 points)

Problem

Consider the undirected graph $G = (V, E)$ where V, the set of nodes, is $\{1, 2, 3, 4\}$ and E, the set of edges, is $\{\{1, 2\}, \{2, 3\}, \{1, 3\}, \{2, 4\}, \{1, 4\}, \}$. Draw the graph G.

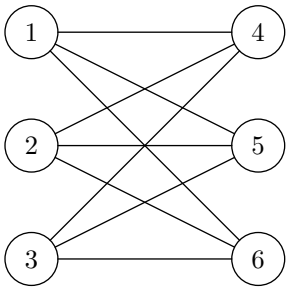
Solution



Exercise 0.9 (5 points)

Problem

Write a formal description of the following graph.



Solution

The undirected graph above has the set of nodes: {1, 2, 3, 4, 5, 6 }. the set of edges is { {1,4} {1,5}, {1, 6}, {2, 4}, {2, 5}, {2, 6}, {3, 4}, {3, 5}, {3, 6},}