Homework 1

- 0.1:
  (a) all positive odd number
  (b) all even number
  (c) all positive even number
  (d) all positive number that is multiple of 6
  (e) palindrome number with only 0s and 1s
  (f) empty set
- 0.2:
  (a) {n | n = 1 or 10 or 100}
  (b) {n | n $\in$ $\mathbb{N}$ and n $>$ 5}
  (c) {n | n $\in$ $\mathbb{Z}$ and n $<$ 5}
  (d) {aba}
  (e) $\{\epsilon\}$
  (f) {}
- 0.3:
  (a) No
  (b) Yes
  (c) {x, y, z}
  (d) {x, y}
  (e) $\{< x, x >, < x, y >, < y, x >, < y, y >, < z, x >, < z, y >\}$
  (f) {{}, {x}, {y}, {x,y}}
- 0.4:
  Select one element from A and one from B forms A x B, so there are $a * b$ elements in the set.
- 0.5:
  Each element in C can either be in or not in an element in power set of C. The number of elements is 2^c.

- 0.6:
  (a) 7
  (b) Range = {6, 7}, domain = {n | n $\geq$ 1 and n $\leq$ 5 where n $\in$ $\mathbb{Z}$}
  (c) 6
  (d) Domain = {n | n $\geq$ 1 and n $\leq$ 5 where n $\in$ $\mathbb{Z}$}

$$\text{Range} = \begin{cases} \{10\} & \text{if } X = 1 \\ \{6, 7, 8, 9, 10\} & \text{if } X = 2 \\ \{7, 8, 9\} & \text{if } X = 3 \\ \{6, 7, 8, 9, 10\} & \text{if } X = 4 \\ \{6\} & \text{if } X = 5 \end{cases}$$

  (e) 8
- 0.7:
  (a)

	1	2	3
1	V	V	
2	V	V	V
3		V	V

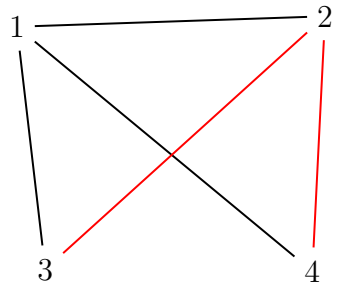
  (b)

	1	2	3
1	V	V	
2		V	
3			V

(c)

	1	2	3
1	V	V	
2	V	V	
3			

- 0.8:
  Red line indicates path from node 3 to node 4



deg(1) = 3, deg(2) = 3, deg(3) = 2, deg(4) = 2

- 0.9:
  G = (V, E) where
  V = {1,2,3,4,5,6}, E={{1,4},{1,5},{1,6},{2,4},{2,5},{2,6},{3,4},{3,5},{3,6}}