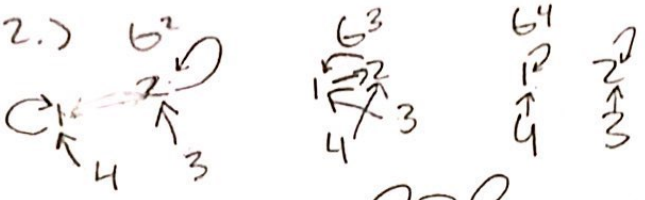
Will May

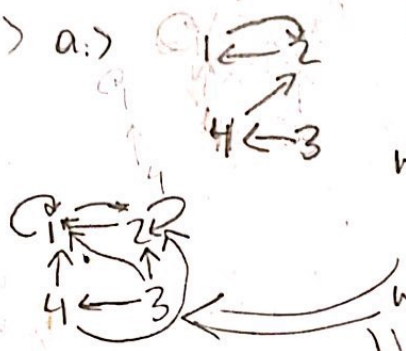
M6 HW

6.1 1.) a.) No
b.) Yes
c.) No
d.) Yes

2.)



3.) a.)



M_R =

	1	2	3	4
1	0	1	0	0
2	1	0	0	0
3	0	0	0	1
4	0	1	0	0

M_2 =

	1	2	3	4
1	1	0	0	0
2	0	1	0	0
3	0	1	0	0
4	1	0	0	0

M_3 =

	1	2	3	4
1	0	1	0	0
2	1	0	0	0
3	1	0	0	0
4	0	1	0	0

M_4 =

	1	2	3	4
1	1	0	0	0
2	0	1	0	0
3	1	0	0	0
4	0	1	0	0

M_5 =

	1	2	3	4
1	0	1	0	0
2	1	0	0	0
3	0	1	0	0
4	0	1	0	0

M_6 =

	1	2	3	4
1	1	0	0	0
2	0	1	0	0
3	1	0	0	0
4	1	0	0	0

G^+ =

	1	2	3	4
1	1	1	1	1
2	1	1	1	1
3	1	1	1	1
4	1	1	1	1

b.)

c.)

6.2 1.) a.) M_R

	1	2	3	4
1	0	1	0	0
2	0	0	1	0
3	0	0	0	1
4	0	1	0	0

G_2

	1	2	3	4
1	0	0	1	0
2	0	0	0	1
3	0	1	0	0
4	0	0	1	0

G_3

	1	2	3	4
1	0	0	0	1
2	0	1	0	0
3	0	0	1	0
4	0	0	0	1

G_4

	1	2	3	4
1	0	1	0	0
2	0	0	1	0
3	0	0	0	1
4	0	1	0	0

G^+

	1	2	3	4
1	0	1	1	1
2	0	1	1	1
3	0	1	1	1
4	0	1	1	1

2.) a.) M_R

	1	2	3	4	5	6
1	0	0	0	0	0	1
2	1	0	0	0	0	0
3	0	1	0	1	0	0
4	0	0	1	0	1	0
5	0	0	0	0	1	1
6	0	1	0	0	0	0

b.) G_2

	1	2	3	4	5	6
1	0	1	0	0	0	0
2	0	0	0	0	0	1
3	1	0	1	0	1	0
4	0	1	0	1	1	0
5	0	1	0	0	1	1
6	1	0	0	0	0	0

c.) {(4,2), (4,4), (4,5), (4,6)}

d.) {(1,2), (4,2), (5,2)}

6.2 3.) a.) $\{(2,2),(4,2)\}$

b.) 2

c.) No

d.) Yes

6.3 1.) a.) Minimal: J, I, A, F

b.) Maximal: J, H, D, G

c.) Comparable: (A,D), (B,F), (D,B), (H,I).

6.4 1.) a.)
- Reflexive
- Symmetric
- NOT Transitive

∴ not equivalence relation

b.)
- Reflexive
- Symmetric
- Transitive

∴ equivalence relation

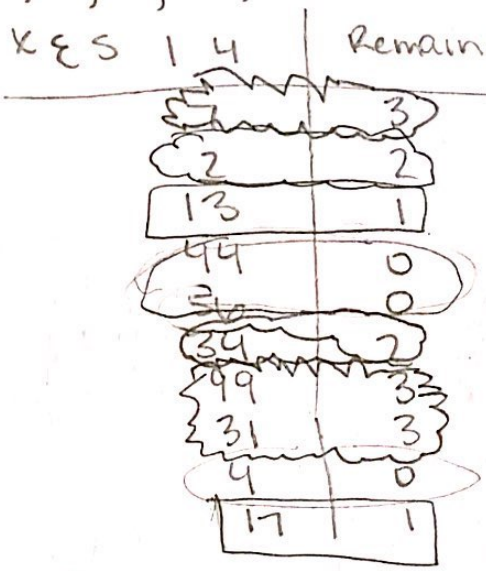
c.)
- Reflexive
- Symmetric
- NOT Transitive

∴ not equivalence relation

d.)
- Reflexive
- Symmetric
- Transitive

∴ equivalence relation

2.) a.) $S = \{7, 2, 13, 44, 56, 34, 99, 31, 4, 17\}$



$S(0) = \{44, 56, 4\}$

$S(1) = \{13, 17\}$

$S(2) = \{2, 34\}$

$S(3) = \{7, 99, 31\}$

↑ equivalence classes of D

5.) a.)
- Reflexive since $x - x = 0$ & $3 \cdot 0 = 0$
- Symmetric since m is an integer & so is $-m$
- Transitive since a & b are both integers & so is $a + b$

∴ equivalence relation

b.)
- not reflexive since $1 + 1 = 2$
- symmetric
- not transitive

∴ not equivalence relation.