

Homework

6.1

1.) a.) No

b.) yes $\langle b, c, f, e \rangle$

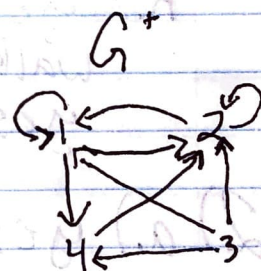
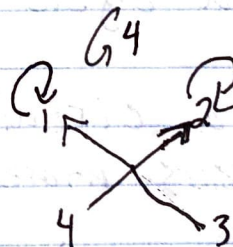
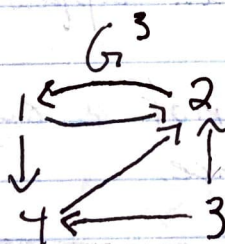
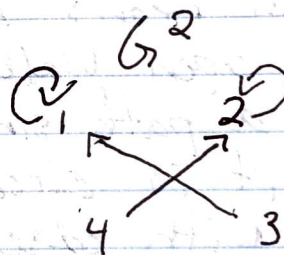
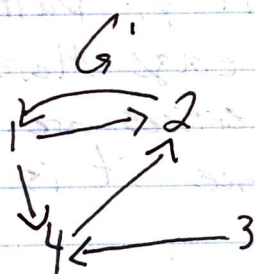
c.) No

d.) yes $\langle g, c, g, c, g \rangle$

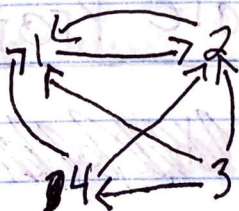
e.) yes $\langle b, c, d, b \rangle$

f.) yes $\langle b, c, f, e, c, d \rangle$

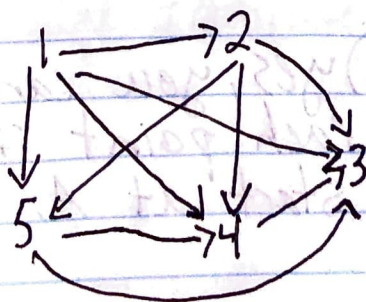
2.) a.)



3.) a.)



b.)



Homework

6.2

1.) a.)

$$G = \begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 \end{bmatrix}$$

$$G_2 = \begin{bmatrix} 0 & 1 & 1 & 1 \\ 0 & 1 & 1 & 1 \\ 0 & 1 & 1 & 1 \\ 0 & 1 & 1 & 1 \end{bmatrix}$$

$$G_3 = \begin{bmatrix} 0 & 1 & 1 & 1 \\ 0 & 1 & 1 & 1 \\ 0 & 1 & 1 & 1 \\ 0 & 1 & 1 & 1 \end{bmatrix}$$

$$G_4 = \begin{bmatrix} 0 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \end{bmatrix}$$

$$G^+ = \begin{bmatrix} 0 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \end{bmatrix}$$

2.) a.)

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 1 \\ 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 & 1 \\ 0 & 1 & 0 & 0 & 0 & 0 \end{bmatrix}$$

b.) Use Matrix G above. $G^2 = G \cdot G$

$$= \begin{bmatrix} 1 & 1 & 0 & 0 & 0 & 1 \\ 1 & 1 & 0 & 0 & 0 & 1 \\ 1 & 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 0 & 0 & 1 & 1 \\ 1 & 1 & 0 & 0 & 0 & 1 \end{bmatrix}$$

c.) $\langle 2, 4, 5, 6 \rangle$

d.) $\langle 4, 1 \rangle$

Homework

6.3 + 6.4

1.) a.) I, A, F

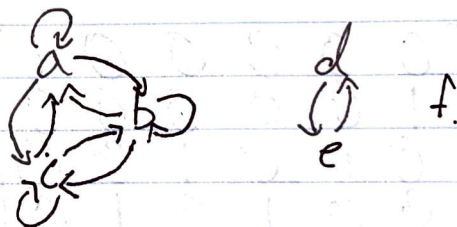
b.) H, D, G

c.) $\{(A, D), (G, F), (D, B), (H, I)\}$

6.4

1.) a.) Not equivalent since x, y can share mother and y, z share father, but x, z are unrelated. Therefore not transitive.

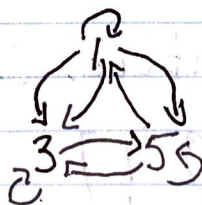
b.) yes



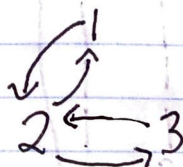
c.) yes



d.) yes



e.) ~~yes~~ No



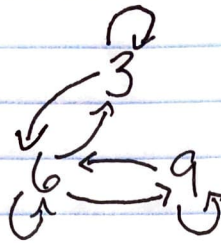
* Any number plus itself is even

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

Homework

6.4

5.) a.) No



b.) yes

