

1) a) no      b) yes      c) yes

2) a)  $V = \{0, 1, 3\}$

3 1 2 1 9  
2 2 0 2  
1 2 1 1  
p 1 0 1 2

4 -adj: NO because the final  
next to q is not 4 adj to  
any 0 or 1

3 1 2 1 9  
2 2 0 2  
1 2 1 1  
p 1 0 1 2

8-ady yes with 4 ~~paths~~ lines

$$\begin{array}{ccc|c} 3 & 1 & 2 & 1 \\ 2 & 2 & 0 & 2 \\ 1 & 2 & 1 & 1 \\ \hline p & 1 & 0 & 1 \end{array} \quad \begin{array}{c} 9 \\ 2 \\ 1 \\ 2 \end{array}$$

m-adj ~~Handwritten text~~  
~~Handwritten text~~  
 facts of ~~Handwritten text~~ yes  
 S liner

b)  $V = \{1, 2\}$

$$\begin{array}{cccc} 3 & 1 & 2 & 1^q \\ 2 & 2 & 0 & 2 \\ 1 & 2 & 1 & 1 \\ p & 1 & 0 & 1 & 2 \end{array}$$

4-adj with 6 lines yes

3 1 2 1 1 2  
2 2 0 1 1 2  
1 2 1 1 1 2  
p 1 0 1 2

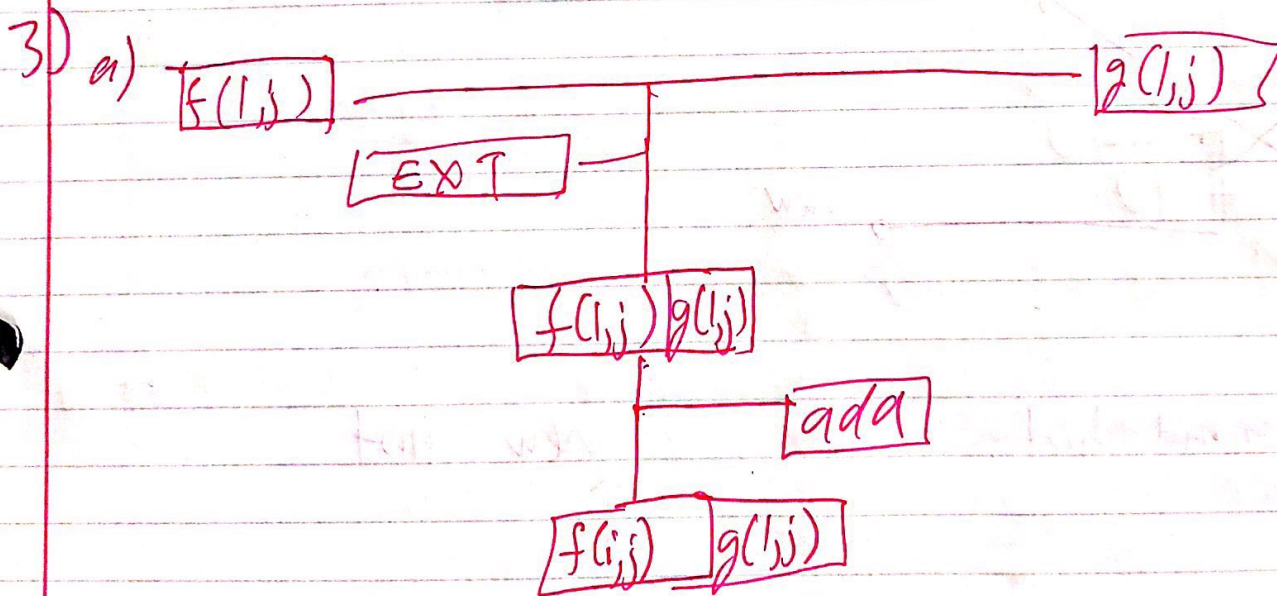
8-adj yes with ~~4~~ lines  
4



b)  $V = \{1, 2\}$

$$\begin{array}{cccc} 3 & 1 & 2 & 2 \\ 2 & 2 & 0 & 2 \\ 1 & 2 & 1 & 1 \\ p & 0 & 1 & 2 \end{array}$$

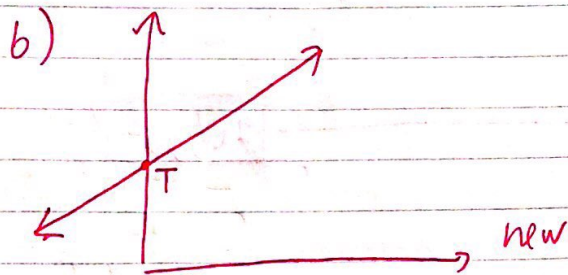
madj - yes <sup>5</sup> line



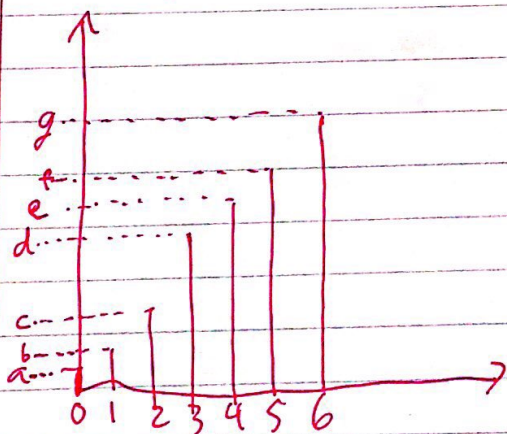
b)

$$\begin{bmatrix} * & 2 & 4 \\ 3 & 8 & 7 \\ * & -2 & * \end{bmatrix}$$

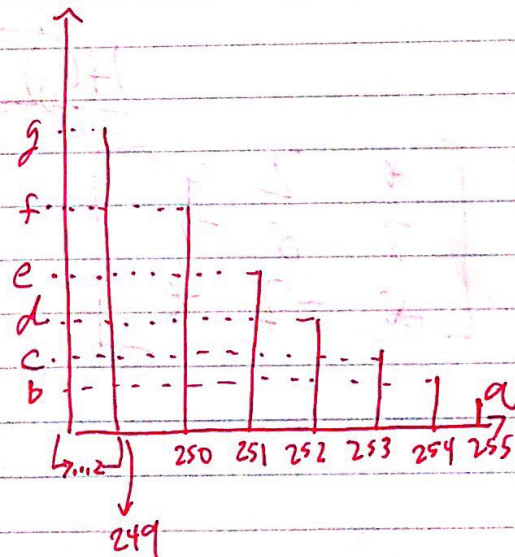
4) a) transformation function if  $f(x)=y$  is the original function then after sliding  $T$  it's  $f(x+T)=y$



5) original hist



new hist



transformation  $255-x=y$