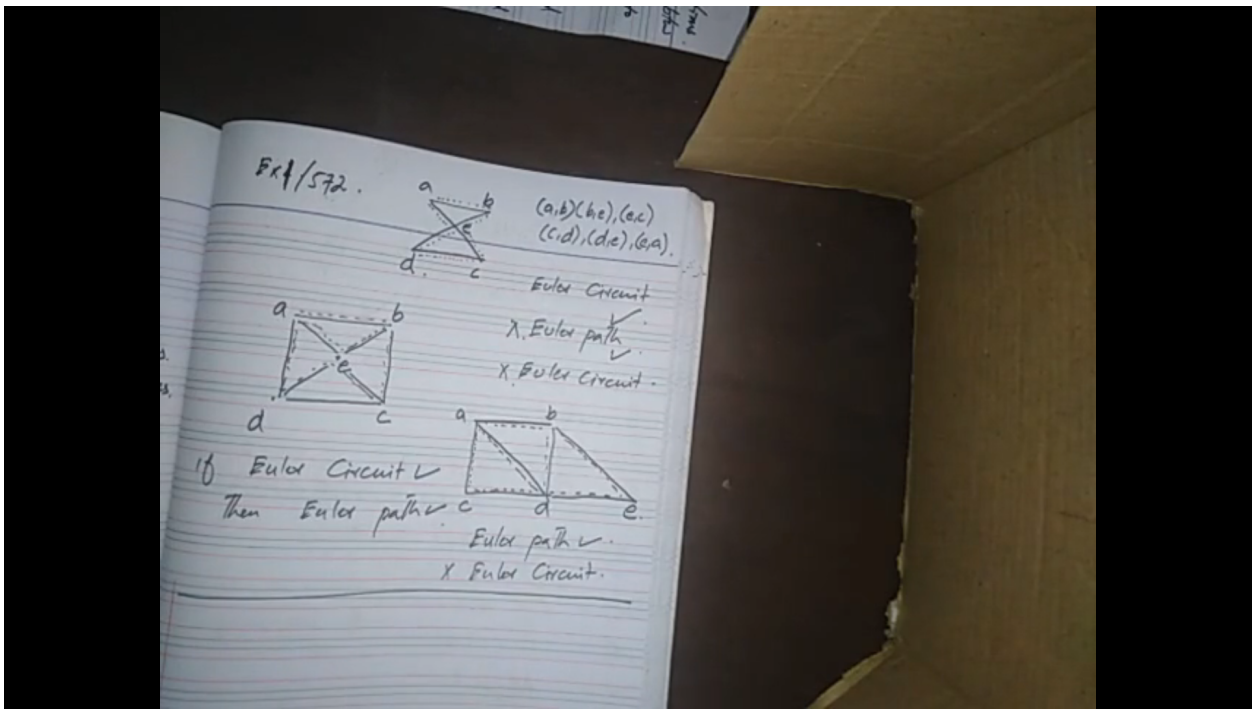
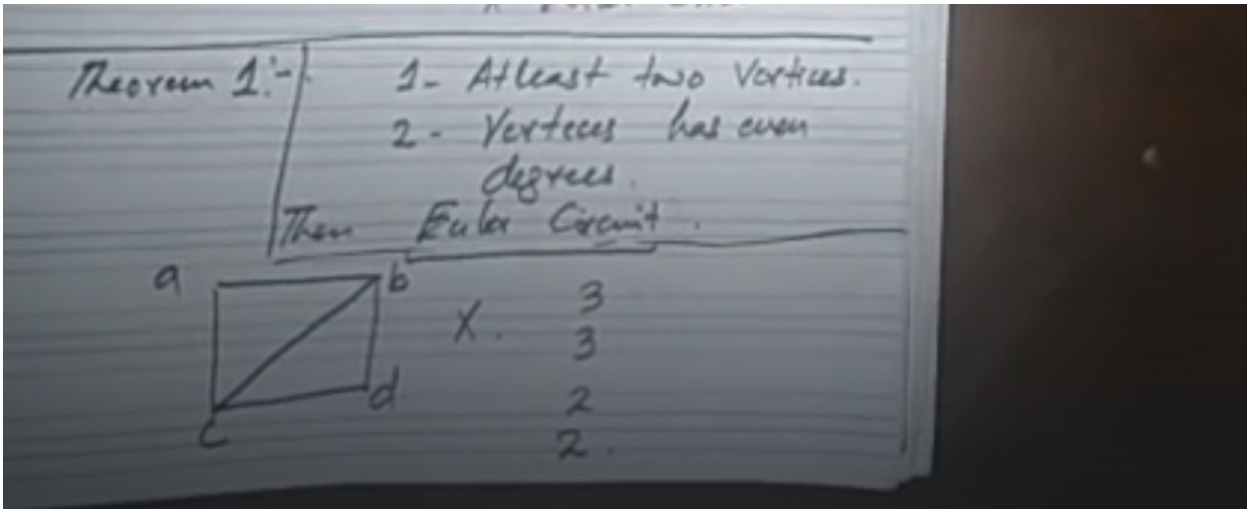
Discrete Lecture # 24

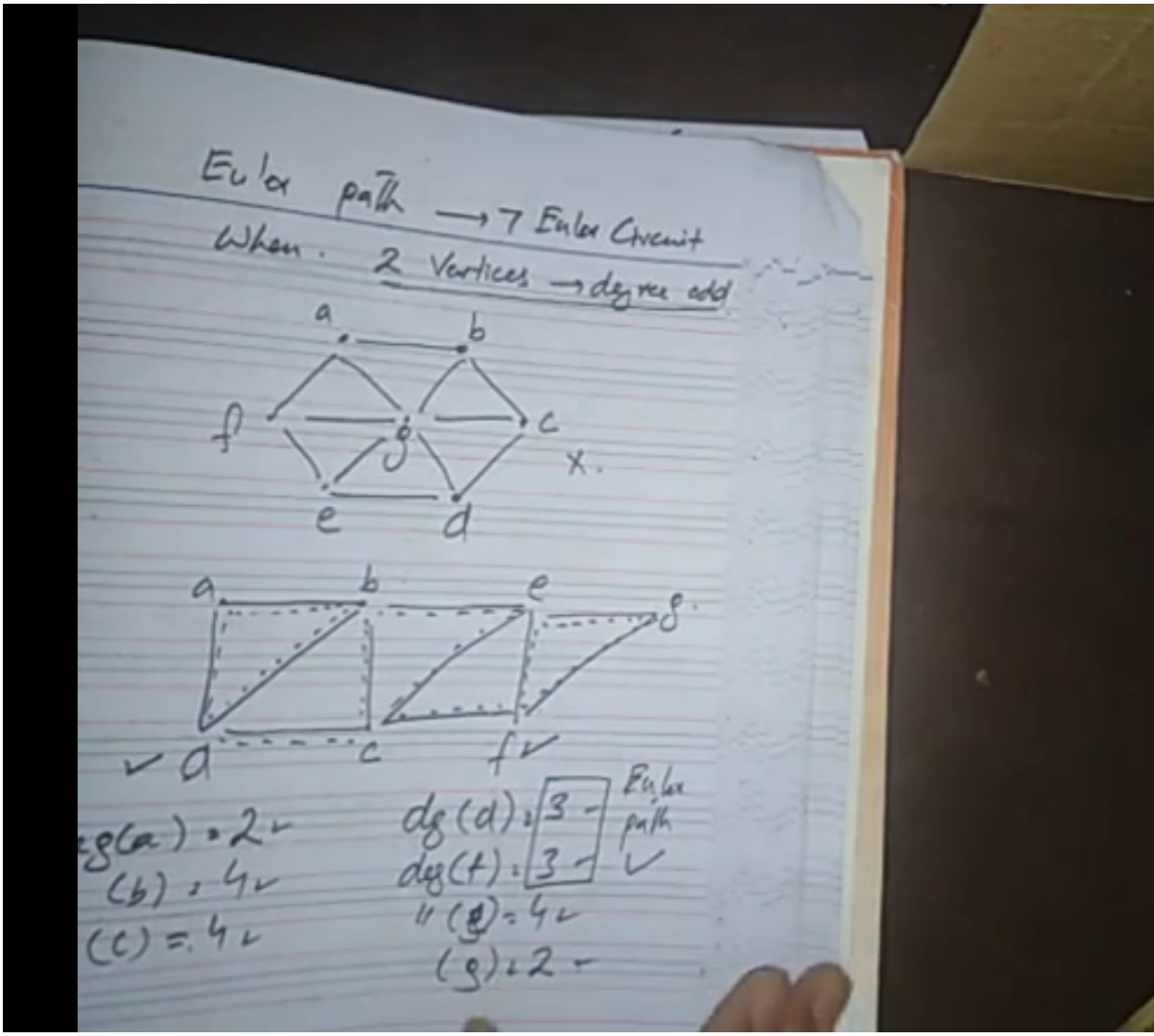
- Euler Circuit : is a
  - Simple circuit
  - Contains all **EDGES**
  - No repitions of **EDGES**
  - Start and end should be same
  - A circuit in which you transverse all the **EDGES** once and traverse back to where you started

- Euler Path : is a
  - Simple path
  - Start and end can be different
  - Every **EDGES** should be traversed only once
  - A path in which you transverse all the **EDGES** irrespective of the start and end should be the same rule
- 

- Theorem for Euler Circuit (easier way) :
  - At Least two **VERTICES**

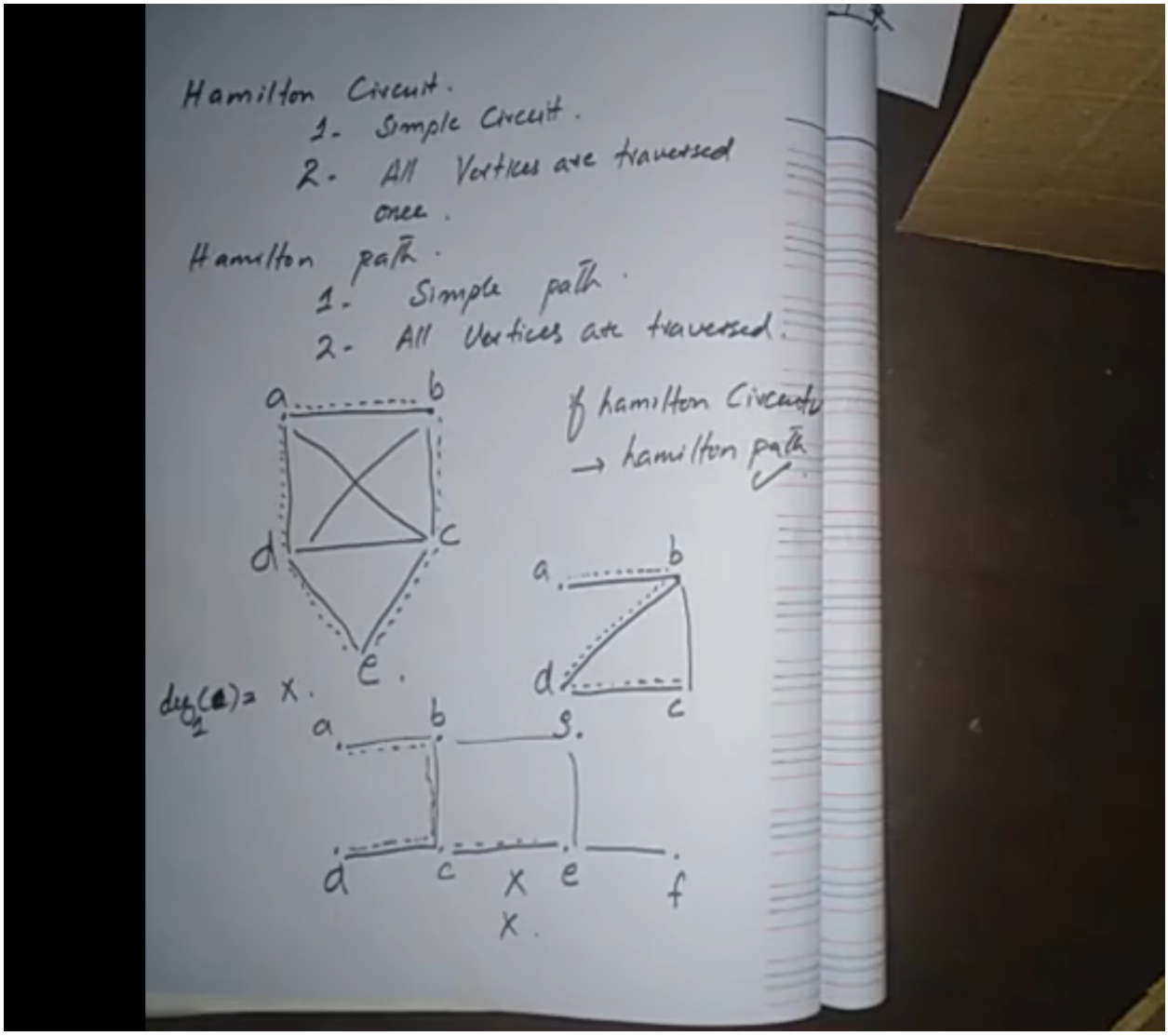
    - **VERTICES** has even degree
    - Euler circuit will only exist if the above two conditions are met otherwise no euler circuit
    - 

- Theorem for Euler Path (easy way) :
    - When you find exactly 2 **VERTICES** of odd degree
    - Euler path will exist

- 

- Hamilton Circuit :
  - Simple Circuit
  - Start and end should be the same
  - All **VERTICES** are traversed once

- Hamilton Path :
  - Simple Path
  - All vertices are traversed
- Theorem for Hamilton Circuit :
  - If you find any vertex of degree 2 in the graph then you wont find any Hamilton circuit in that graph

- 
Hamilton Circuit.
1- Simple Circuit.
2- All Vertices are traversed once.
Hamilton path.
1- Simple path.
2- All Vertices are traversed.
a
b
c
d
e
If hamilton Circuit
→ hamilton path
deg(e) = x.
a
b
g.
d
c
x
e
f
x.