classmate Tutorial 9 Problem 10.48 [G is a linear strict partial order of for part (a) (a) we will use induction for this proof. Lemma & There always excists a directed path passing exactly through in given vertices of a linear strict Base case: Take to I vertex only one zero length path laists! Take 2 vertices. An edge orlivays excists blu them since graph is linear order. Only one edge exists since graph is asymmetric due to strict partial order. Unique path & through two vertices. Induction Hypothesis: Let P(n) be the predicate that

"Gaiven or vertices of a linear strict

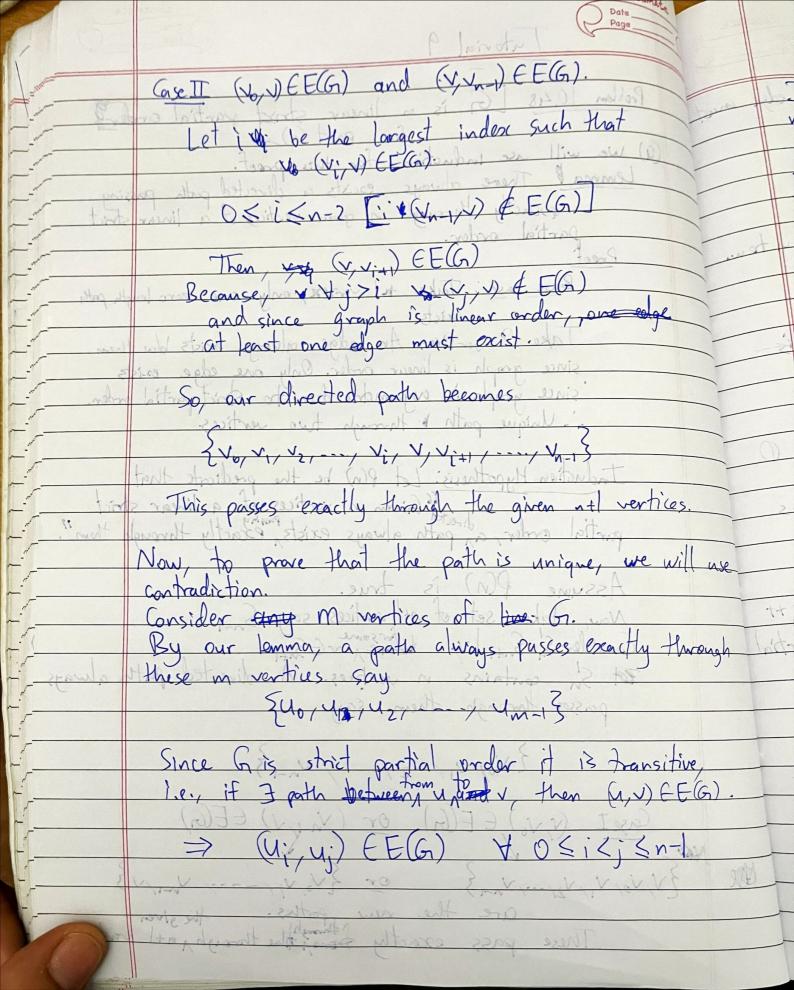
partial order, an path always exists, exactly through them". Assume P(n) is true.

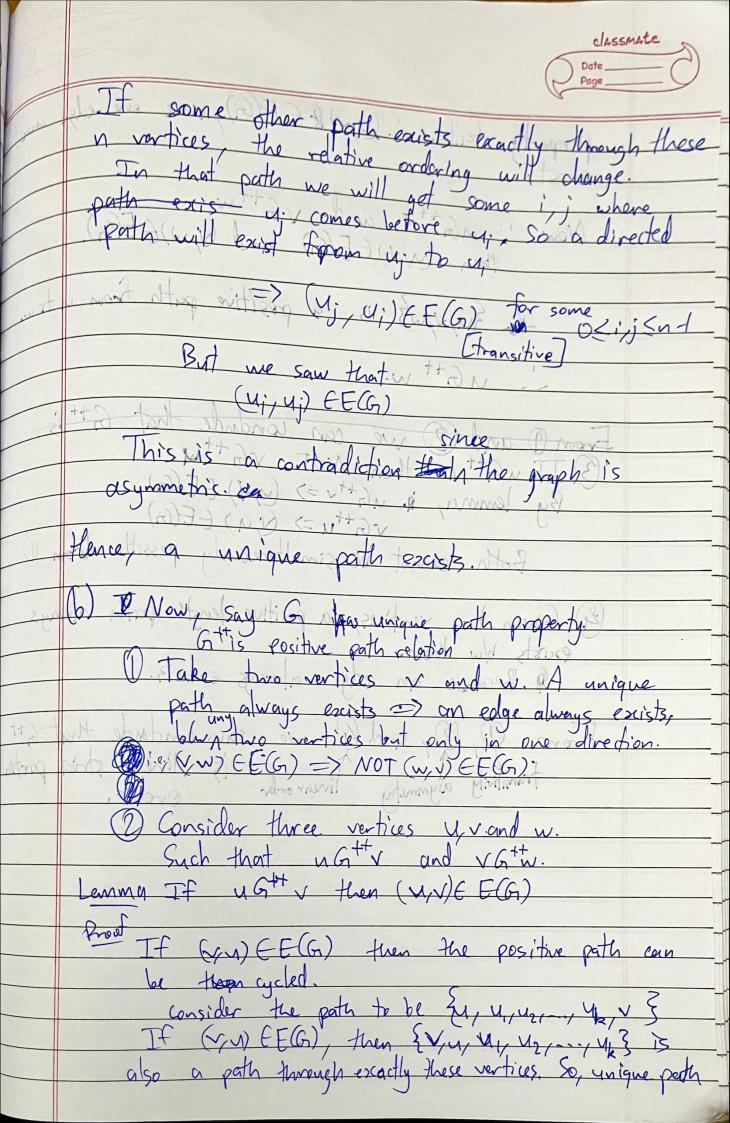
Now, take set of nt vertices say Sn+1 Consider S_= S_n+1 / where n v E Sn+1 directed path always passes through them say 3 Voj V1/ V2/ - 19 V - 18 0 000 Case I (V, Vo) E E(G) or (Vn V) E E(G)

2 V, Vo, V, V2/---/ Vn-13 or {Vo, V, ----/ Vn/V3}

are the new parts. the given

These pass exectly from the given





property fails. - . (M, N) & E E(G), since one edge in Now in short wand vG++w.

Then (yv) EEG) and (yw) EEG). la Euryang is a prositive path from unter 1. UG++ w.tost was on tol From (1) and (2) we can conduct that G++ is

(3) If uG++ then NOT VG++ in.

By lemma, in uG++ v => (u, v) f E(G)

VG++ u => (v, u) (E(G))

Both cannot be simultaneously possible from () exists blu them.

Seconse an edge always exists. From D, B, and G) we can conclude that G++
transitivity asymmetry livear order order order. TI MANAGA