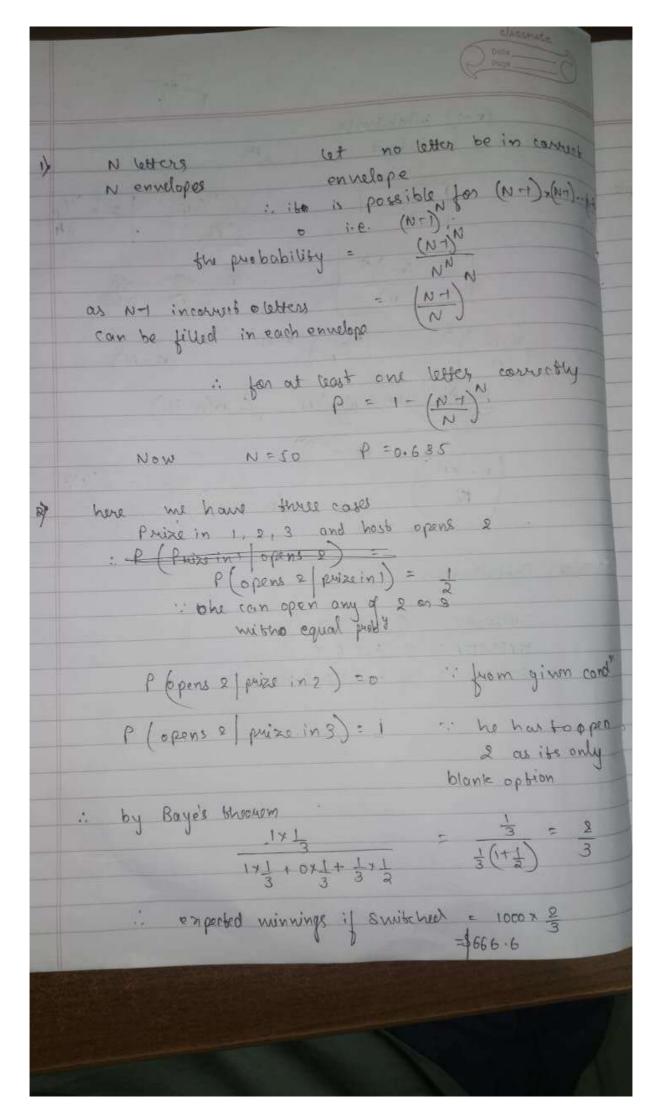
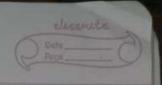
Contribution # HIMANSHU 91,2,3,7 9 4,5,6,9 9 8,10,11; Code MARSHITA: SONALI





8) a) P(ANBIL) = P(A|BNC) P(BIL) > Time

 $\frac{P(A \cap B \cap C)}{P(C)} = \frac{P(A \mid B \cap C)}{P(C)} P(B \cap C) = P(A \mid B \cap C)$ 

b) P(A OBIC) = P(AIC)P(BIC) for indpt A &B => False

P(anbni) we are given only indpre of ABB

P(c) with no information about independence with respect to a hence assuming its not brue, the above eq is falso

c)  $P(A \mid D \cap B^c) > P(A \mid D \cap B)$   $P(A \mid D^c \cap B^c) > P(A \mid D^c \cap B)$   $fun : P(A \mid B) > P(A \mid B^c) \implies False$ 

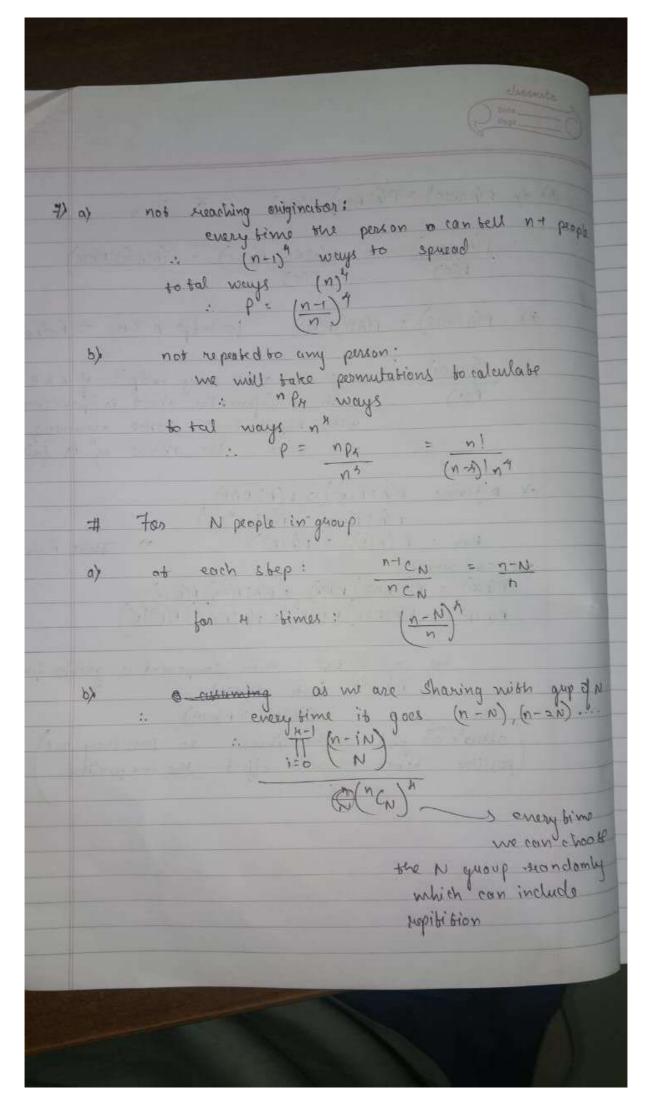
me can write

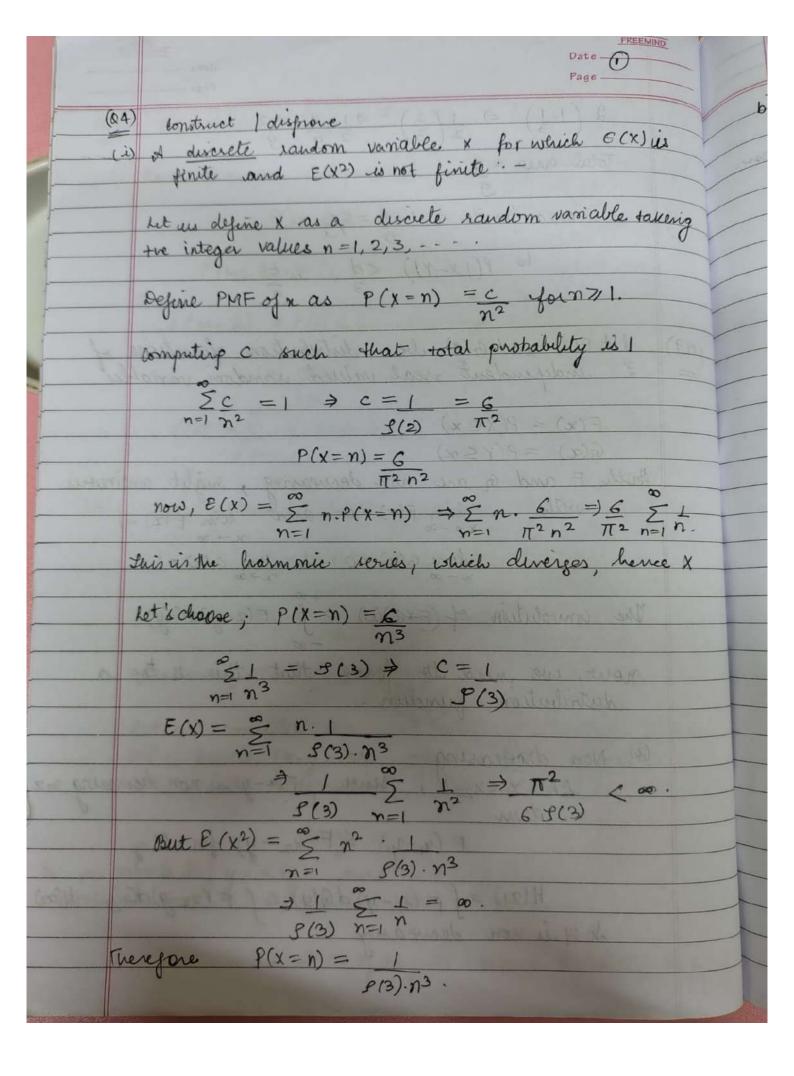
P(A1B) = P(A1DAB) P(DB) + P(A1DAB) P(DB)
P(A1B) = P(A1DAB) P(DB) + P(A1DAB) P(DB)

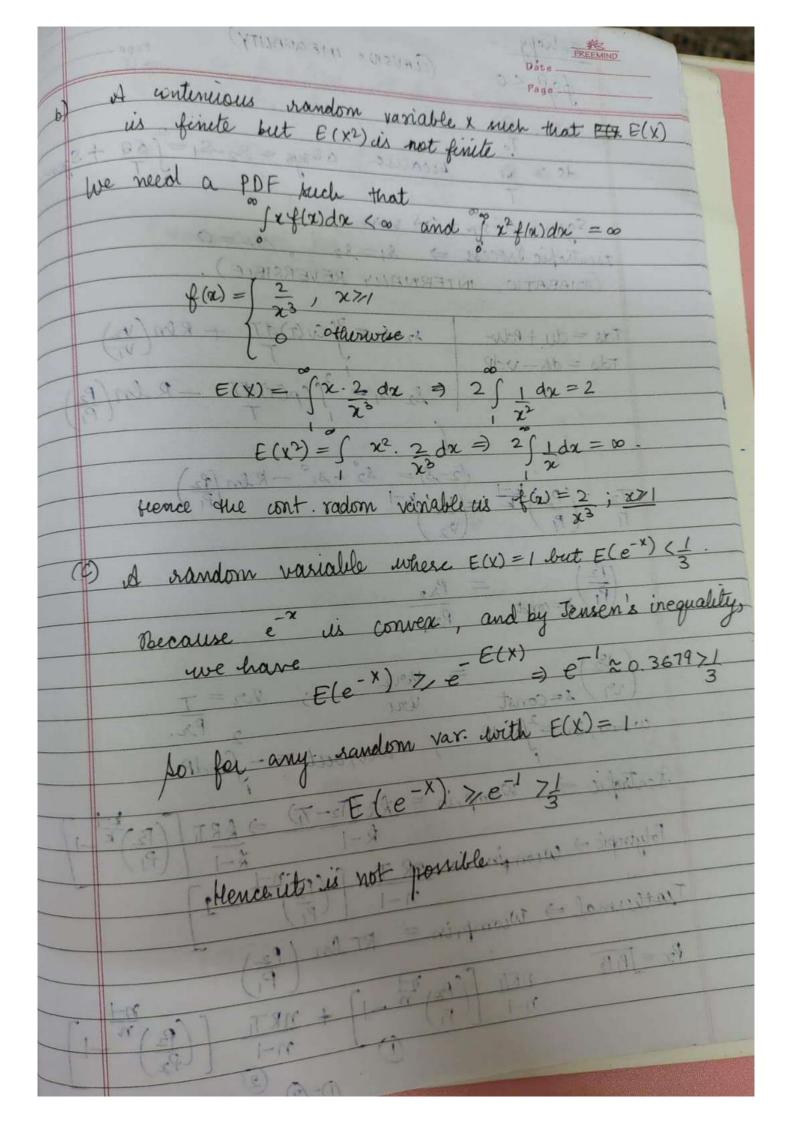
me can see that each component is greater for P(A1B) that P(A1B)

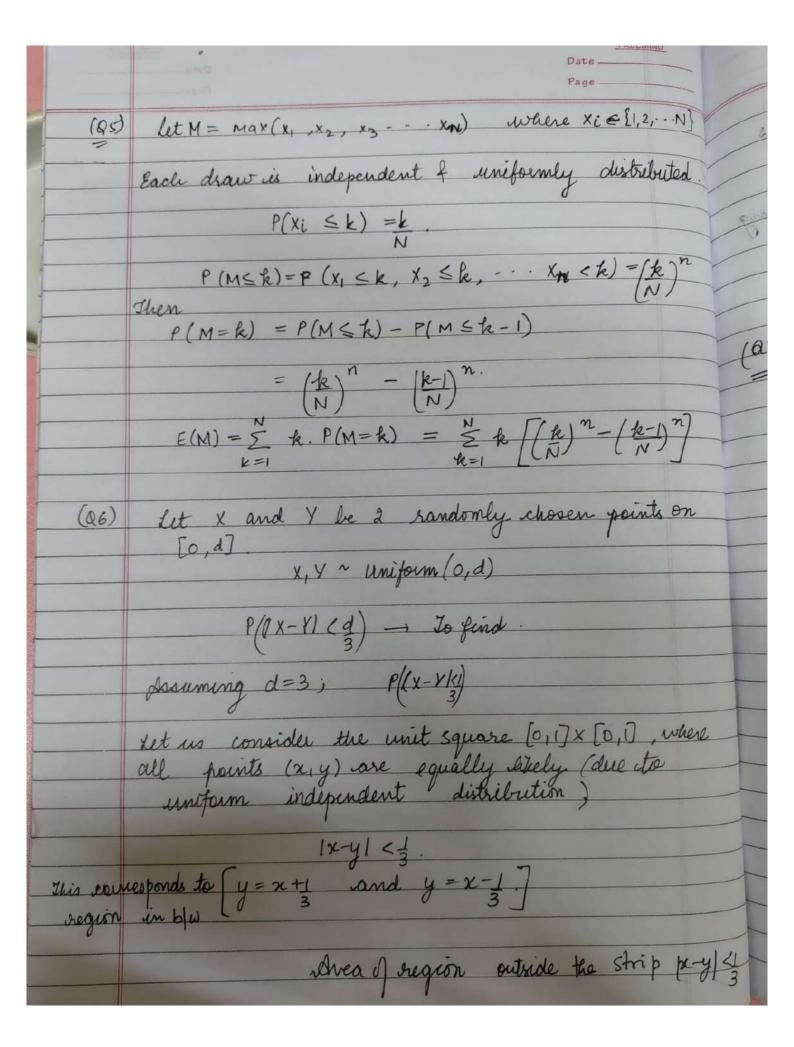
P(A1B) > P(A1B)

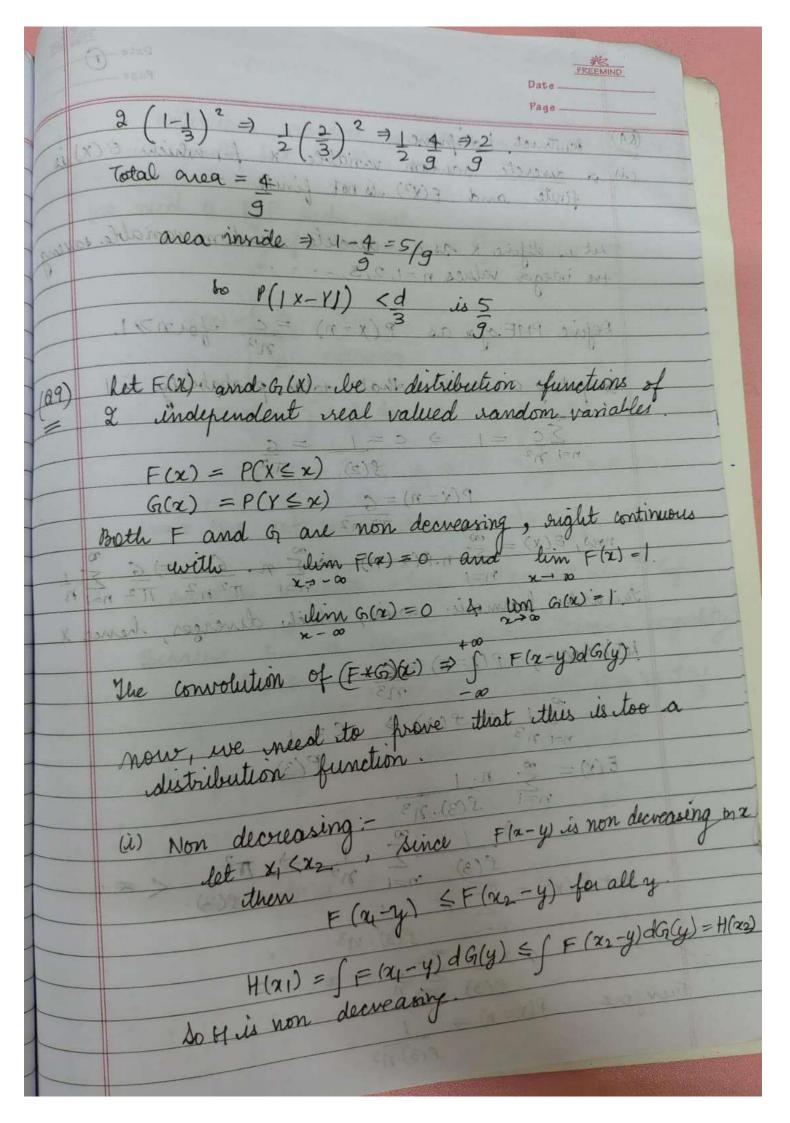
others nave just probabilities so post they are positive hence won't affect the inequality









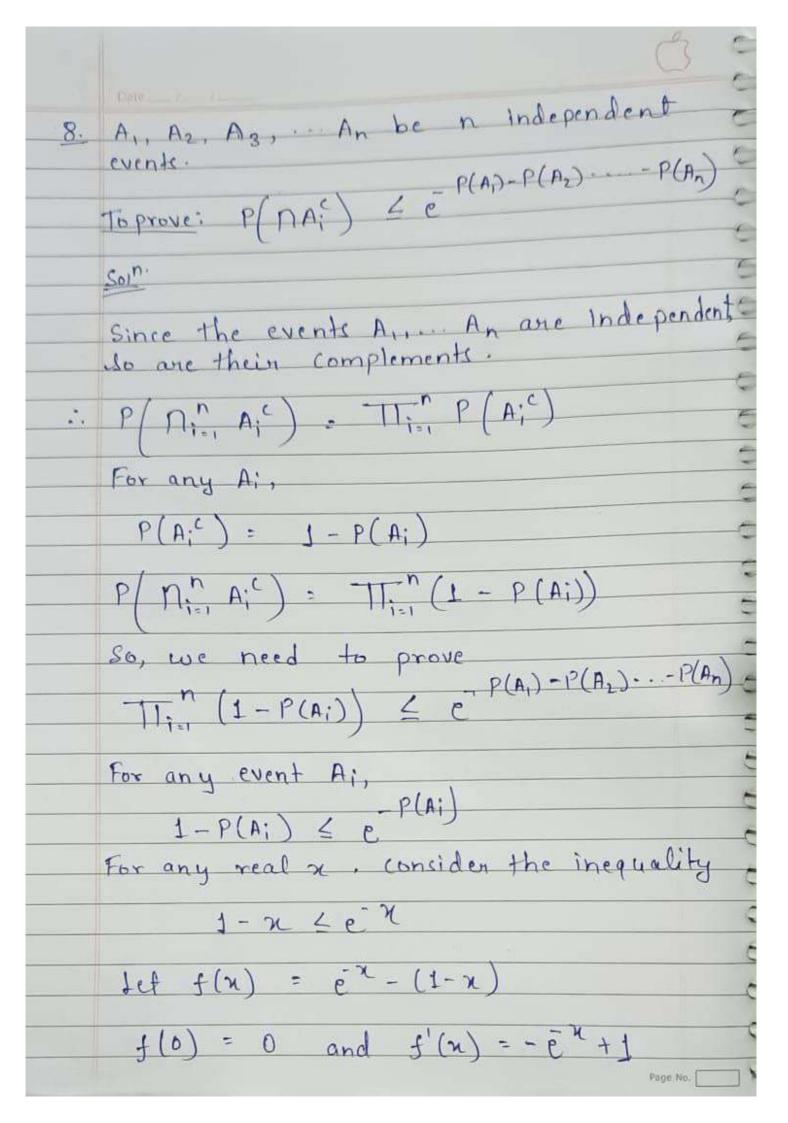


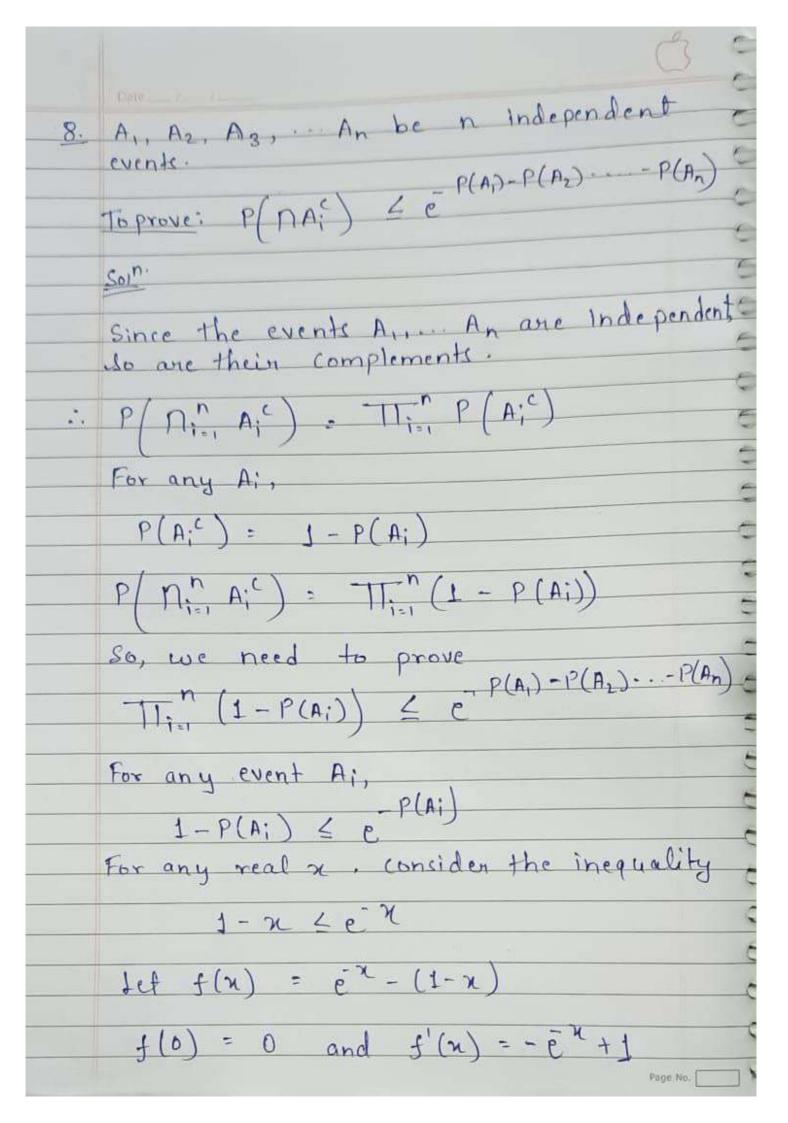
Right continuity:

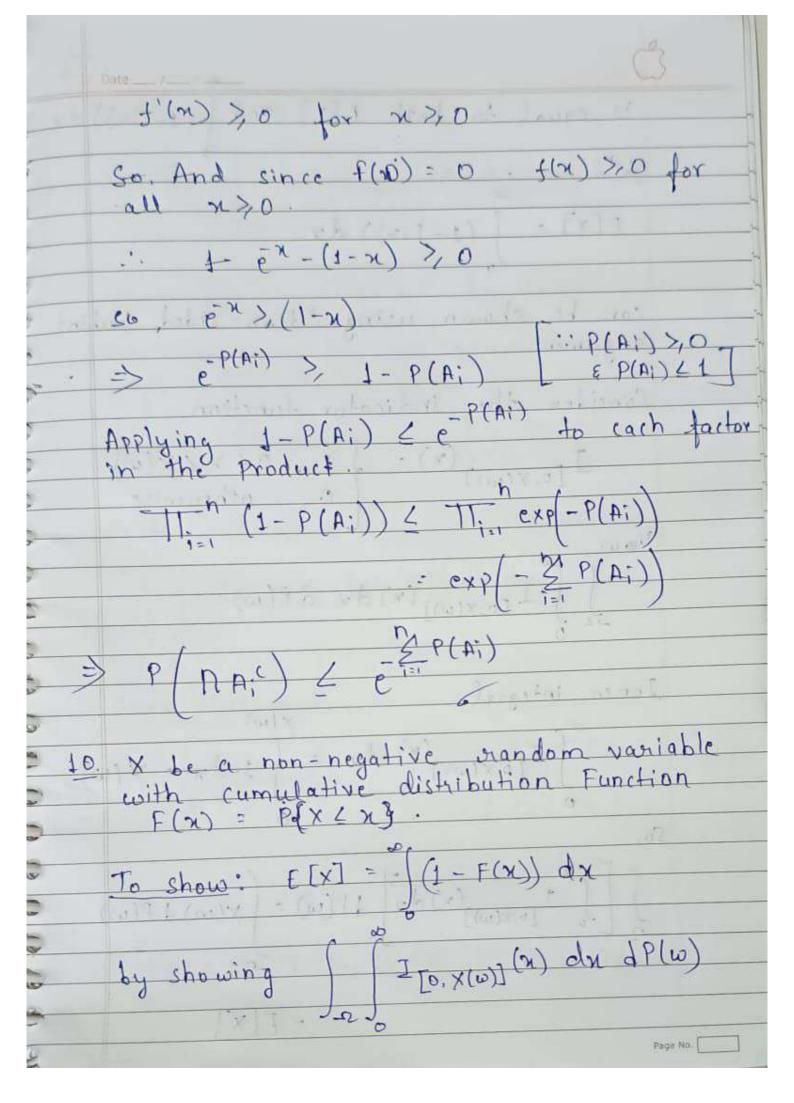
Suppose  $xn \to x$ ; Therefor every y,  $F(xn-y) \to F(x-y)$ By Applying the monotone convergence theorem;  $H(xn) = \int F(xn-y) d F(y) + \int F(x-y) d F(y) = H(x)$ . H(x) is right continuous.

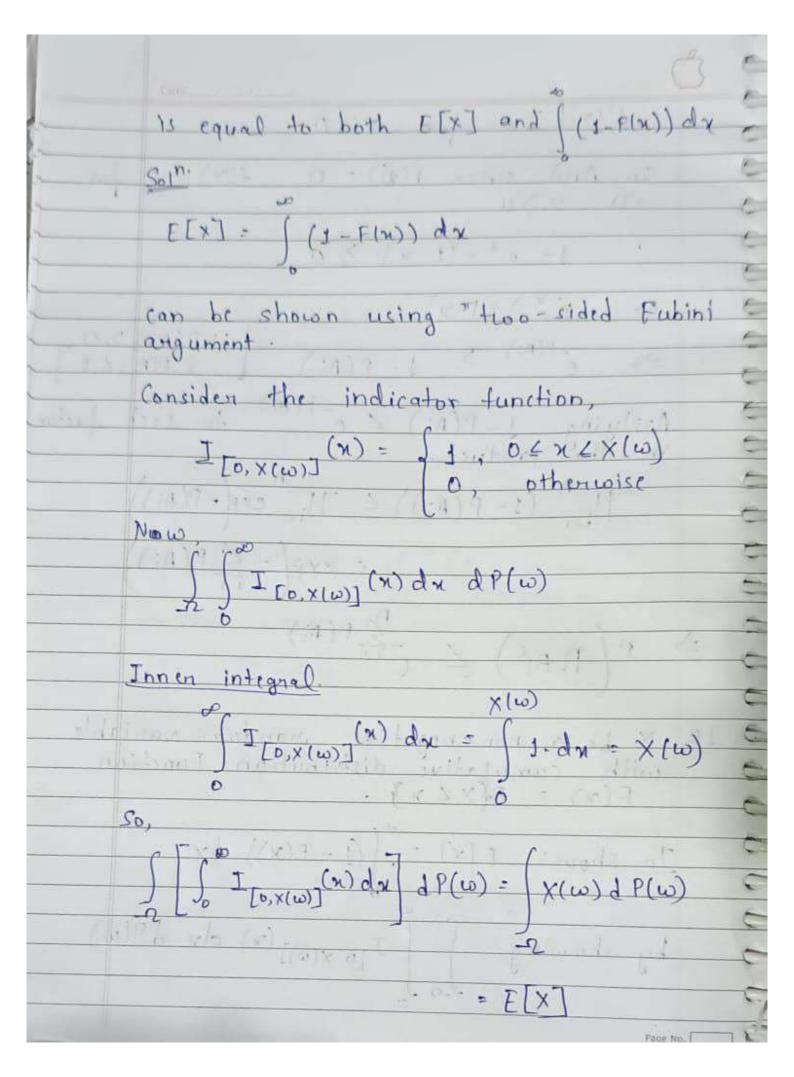
Also; as  $x \to -\infty$ ,  $F(x-y) \to 0$  for all y.

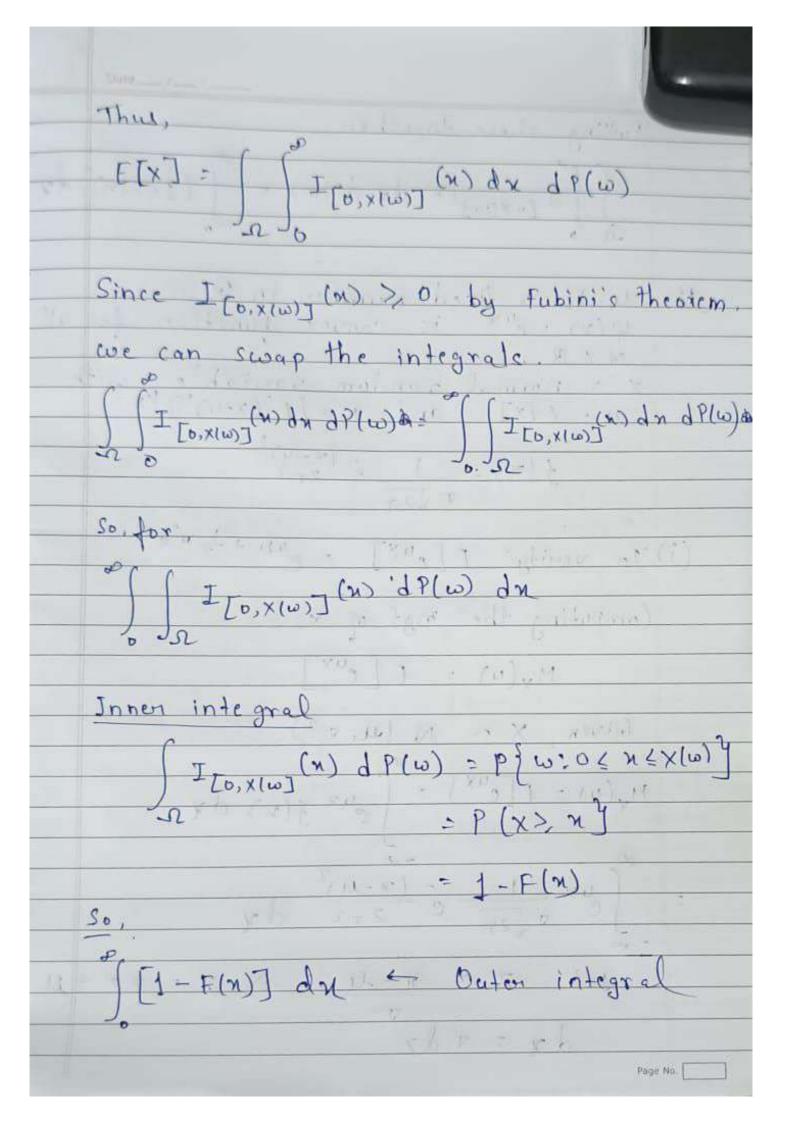
So  $H(x) \to \int 0 dG(y) = 0$ as  $x \to \infty$ ,  $F(x-y) \to 1$  for all y.  $H(x) = \int 1 dG(y) = 1$ Therefore  $H(x) = (F \times G)(x)$  isatisfies all profesties of a distribution function.











So. 00 J271 eul + 4202

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Putting these togethen. [I [0,x(w](x) dx dp(w) = ((1-F(n)) is a fixed number in normal and v = [E (x-u) and f(x)= ) = (x-u)2 (i) To verify: E[eux] = out + 124 Computing the mgf of x, Mx(4) = E Given, X ~ N (u, +2) x-4- 5 x= 2+ 11 x = Td> Page No.

(ii) To verity the Jensen's Inequality Soln. φ(x) = eux Given, P(x) is convex. So. φ"(x) = u2 eux > 0 for all x. Jensen's inequality for any conven & saye Ε[4(x)] > Υ(E[x]) E [eux] >, eu E[x]: pull F[eux] = eul+ 1 u2+ 2 > eul Hence, verified. Besignated (1-10 " out - Tital Na