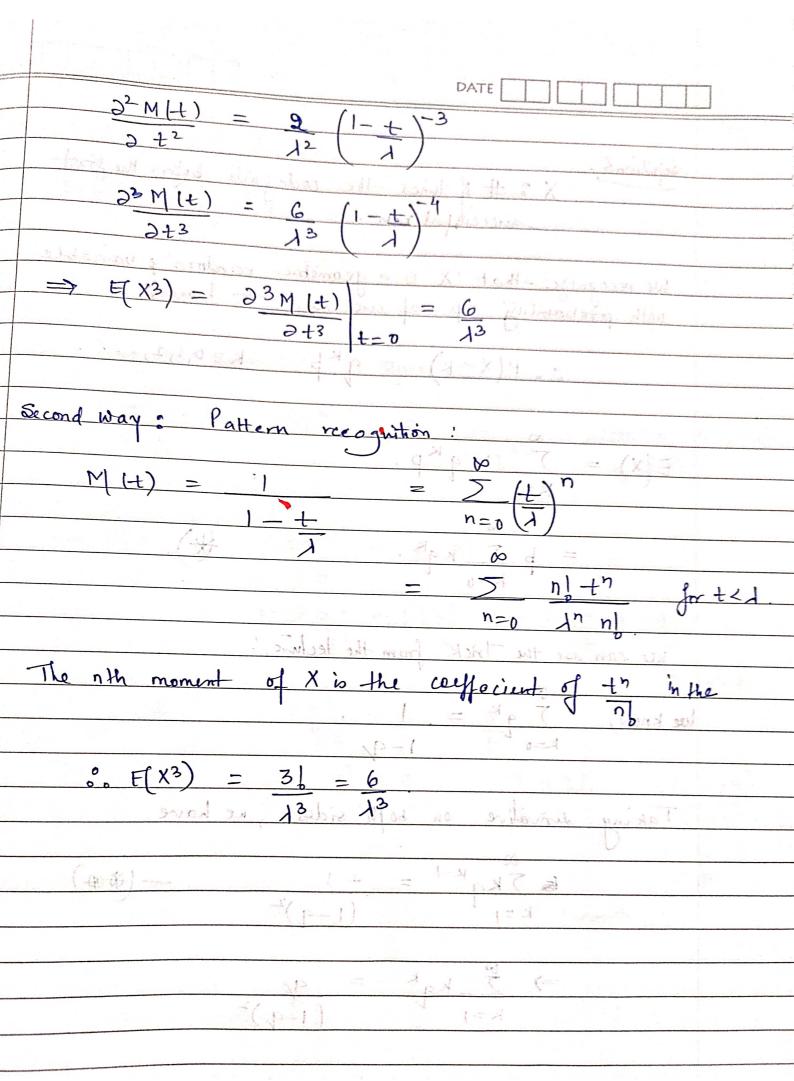
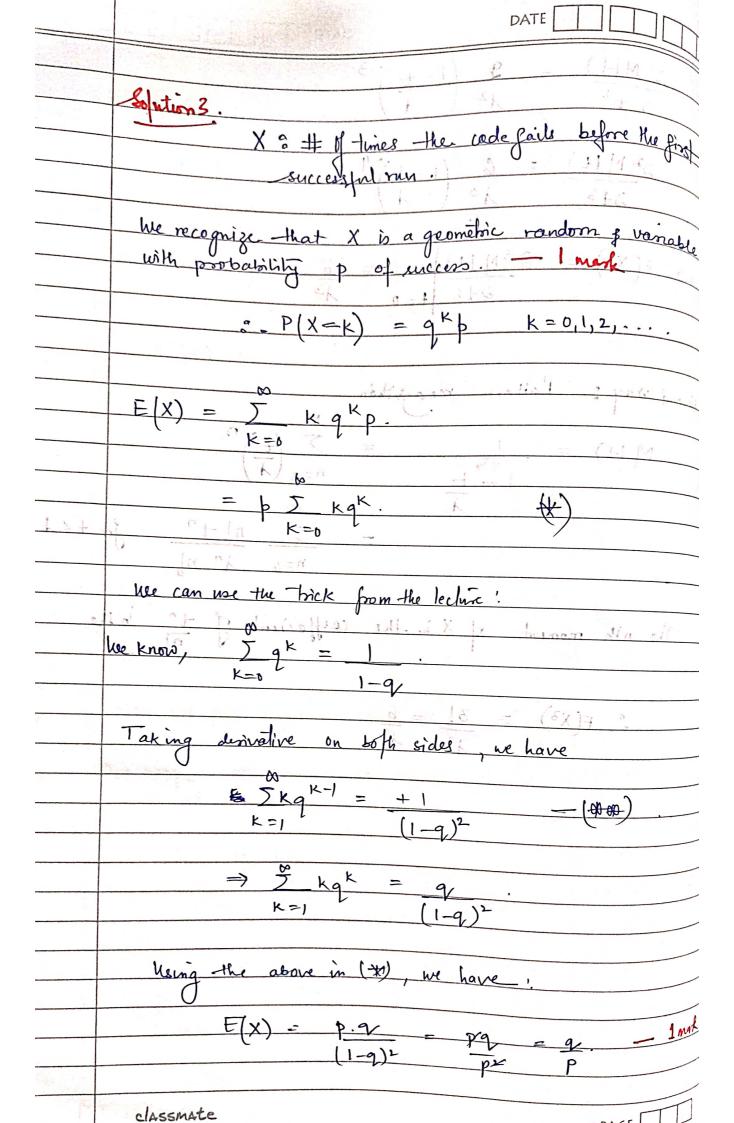
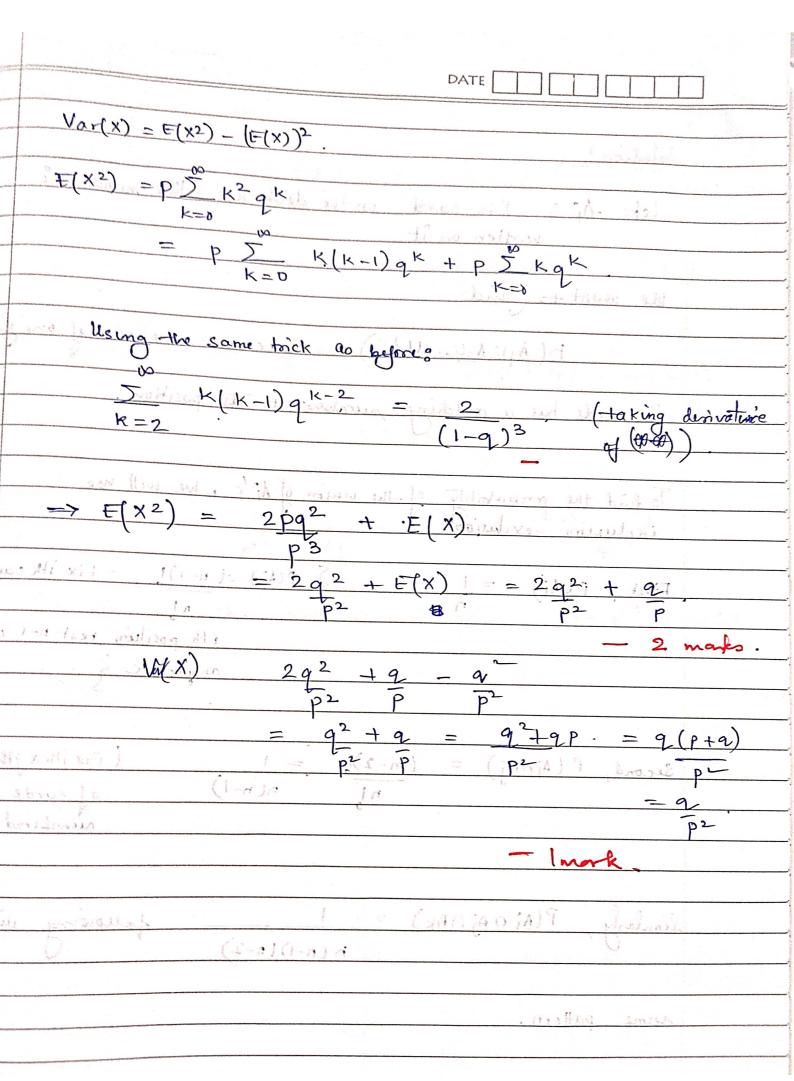
	DATE [[[[[] [] [] []]]
	Mid -sem Examination
parent.	DA 241 (2023)
	Solutions and Mashing Scheme.
antain.	Solution 1
	Solutions. Assume that the doors are labeled such that you choose Door 1.
edencia.	you chaste door 1
-	
	Let us define the following events:
-	S: You got the car following the strategy "stick to
-	So your get the car following the strategy "stick to your original choice".
	O U
-	Cj : Car is behind the door g.
	By law of +ofal probability, we condition on which down hashows: P(S) = P(S C1) · P(C1) + · · · + P(S C7) · P(C4) = 1 because:
	$P(S) = P(S C_1) \cdot P(C_1) + \cdots + P(S C_T) \cdot P(C_T)$
	= 1 becaue:
	the car can be behind any down so P(Cj) = 1 + j=1,,7
_	
	Let Mi,j, x : Monty opens door i,j, and k.
-	$P(S) = \sum_{i,j,k} P(S M ijk) P(Mijk) . 25i < j < k < 7.$
	L'JJ.K
	By Symmetry, P(S Mijk) = P(S) = 1
	=> conditional probability that the car is behind one of the remaining
	3 doors is 6, which implies you should switch because then your
	success probability is 2 rather than I if you stick with your Indial
_	choic.
_	CROIL
_	
	PAGE

Caladia o	-1 . 0115
secution 2. We are given	that X~ Exponential (1)
	-1x x7/0
JX ,	ofw.
uee need-lo find E(X3) nou	ng the MGF of X.
$M(t) = E(e^{tX})$	= [betx 1 = 12 dx
	Jo e de de
	= 1 (00 -11-t)x
	,
	$= \lambda \frac{e^{(\lambda-t)}}{e^{(\lambda-t)}}$
	-(x-t)
	- 110
	$= \lambda \left(0 + \frac{1}{\lambda - \epsilon}\right) \lambda > 0$
	$=$ λ $\pm \langle \lambda$.
Now we need to use this M	1GF to Rid =Tv3)
One way a he cantake—the— it at t = 0	hist derivative of MI+), and
it at t = 0	- 10.7 g 20
NILLY	
$M(+) = \lambda$	t<>
1	<u>-</u> t
	= - +
	$-(\pm)$ λ
3 M(+) - 1 /1-+	-2
$\frac{\partial M(t)}{\partial t} - \frac{1}{\lambda} \left(\frac{1-t}{\lambda} \right)$	
1 1	/
classmate	
CHOSMALE	PAGE T







	let As & f. th card in the deck has the number ? written on it
gant ething het to taken op hat hemotion	let As & Eth card in the deck
	written on it
tage of the break track the residence of the second track	The state of the s
	the want to find
and the second s	P(A ₁ VA ₂ V UA _n) because me win if one p
	the carde has a matching number to its position.
	A-a-
	1 - Size he will me
	To find the probability of the union of Ai's, we will use inclusion -exclusion.
	6 4
	First $p(A_i) = 1$ $p(A_i) = (n-1)!$ - Fix ith cord in $n!$
- Autom	n a n
	ith position, rest no cante
reja de commenços	anywhere ?.
(843)	1 = db1 b = c + cv =
The state of the s	Second, $P(A_i \cap A_j) = (n-2)!_1 = 1$ (Fix ith & jth points
A Light	n n(n-1) of carde
On the Contract of the Contrac	humbered isj
	2 1 0 24
X	Cemlary, P(Aj nAj nAK) = 1
	h(n-1)(n-2) following me
	same pattern.
	classmate

and the same	DATE [] [] [] []
	Inchesion-exchesion foomenta:
	P(DAi) = 5 P(Ai) = 5 P(AinAj) + F P(AinAjnAk)-
	+ (-1)n+1 P(A/ n+2 n · · n An).
	$\frac{\partial}{\partial x} P(\hat{U}, A_i) = \frac{n}{n} n$
1	
	3 A (A booked) = (A > NE, V, X)) i
	= 1 - 1 + 1 to + - (0-1) n+1 leaves
	$\frac{2!}{3!}$
	(acompan) = (a) (a x x 1) 9 , a = n ji
	For large n, this probability is close to $1-e^{-1}=0.63$.
	(+, y, z) = (+, y, z) +
	b) Joint PDF of X and Y.
	Therefore) = 1 (= 12 = (

