





4MM013 - Computational Mathematics

Mathematics Assignment-2

Full Marks: 20

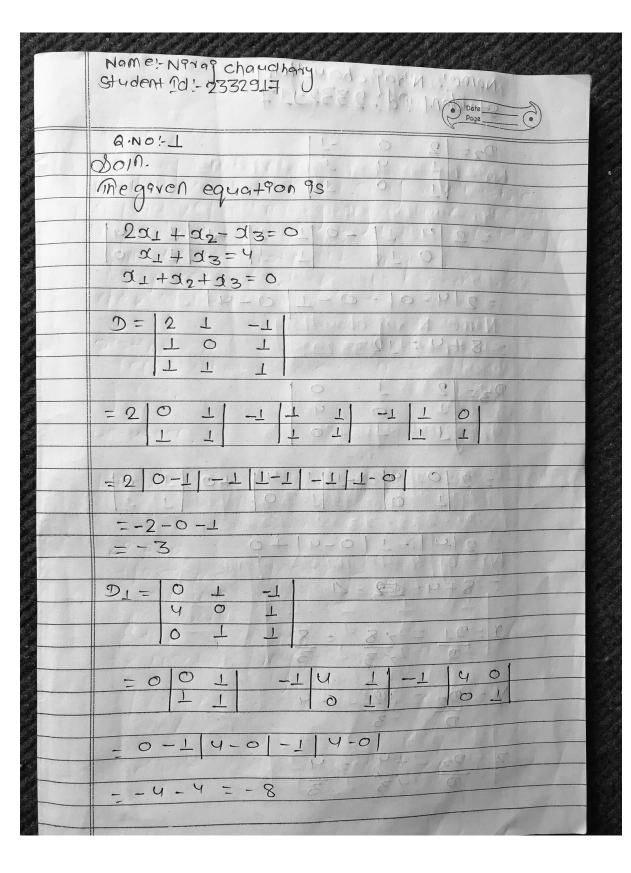
University ID : 2332917

Submitted by : Niraj Chaudhary

Submitted on : Subash Khatiwada

1. Using Cramer's rule obtain the solutions to the following set of equations:

$$2 x_1 + x_2 - x_3 = 0$$
$$x_1 + x_3 = 4$$
$$x_1 + x_2 + x_3 = 0$$



Name! Navag chard havy to forth a month of the page of
D2 = 2 0 -1 1 -0 10 -10 -10 1 10 0 0 0 0 0 0 0
= 2 4 - 0 - 0 - 1 0 - 4 = 2 4 - 0 - 0 - 1 0 - 4 = 2 4 - 0 = 2 4
D ₃ = 2 1 0 1 1 1 1 0 1 1 1 1 0 1 1 1 1 1 1 1
= 2 0 4 -1 1 4 1 + 0 1 6 1 0 1 0 1 1 1 1 1 1 1 1
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
$y = D_2 = 12 = 6 - 9$ $D = -3$ $D = -3$ $D = -3$
D +3 3

(4)

2.

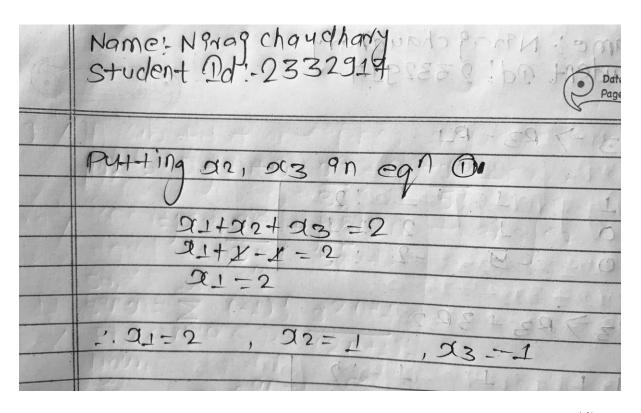
a) Solve the following using Gauss elimination:

$$x_1 + x_2 + x_3 = 2$$

 $2x_1 + 3x_2 + 4x_3 = 3$
 $x_1 - 2x_2 - x_3 = 1$

	OFER HISTORY OF STEHE TO
	图10 10 10 10 10 10 10 10 10 10 10 10 10 1
	Control of the Contro
	Name: Navagachaudhanya attal port
	Studen+10d! 1233 2917
7.8	MANAGER SOLL-LA LATI
	Q.No!-29 80! B E
	2016 1 1-12/2 312 11-12-12-11
	me gaven equation as
	191-09-0
	$\alpha_1 + \alpha_2 + \alpha_3 = 2$
	12 21 + 3 d2 + 4 d3 = 3 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	W19+9ng 9n the matigx form 9s
	100 1 2 12 12 12 12 12 12 13 12 13 12 13 12 13 13 13 13 13 13 13 13 13 13 13 13 13
	11 1 1 12
	2 3 4 1:3
	11 -2 -1 :4 9 1 0
	0.13 12-1-20 8-10
	R27R2-2R1
	11 21 2 1
	0 1 12 1 -1 1
	1 -2 -1:15
	LIP OF O

Name: N999 chaudhary of the country	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Name: Nanag chaudhany Date Date Page
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	R3-7R3-R1
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	- William Morting all grown on pulling
$R_3 > R_3 + 3R_2$ $R_3 > R_3 > R_3$ $R_3 > R_3 > R_$	
$R_3 > R_3 + 3R_2$ $R_3 > R_3 > R_3$ $R_3 > R_3 > R_$	0 1 1 2 2 1-100 400 100
$R_3 \nearrow R_3 + 3R_2$ 1	0-3-2:-1-1
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	2 d 1 = 2 d 1 = 2 d 1 = 10 d 1 d 1 d 1 d 2 d 1 d 2 d 1 d 2 d 1 d 2 d 1 d 2 d 1 d 2 d 1 d 2 d 1 d 2 d 1 d 2 d 1
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Lese Marie Designation
0 0 0 0 0 0 0 0 0 0	10 1 10 110 110 2 100 100 100
W_1 P+ing 9n the equation form 9s. 100 $31 + 27 + 23 = 2 - 10$ $32 + 23 = -1 - 10$ $43 = -4$ $33 = -4$ $94 + 109 = 39 = 90 = 90$ $94 + 109 = 39 = 90 = 90$ $94 + 109 = 39 = 90 = 90$ $94 + 109 = 39 = 90 = 90$ $94 + 109 = 90 = 90$ $94 + 109 = 90 = 90$ $94 + 109 = 90 = 90$ $94 + 109 = 90 = 90$ $94 + 109 = 90 = 90$ $94 + 109 = 90 = 90$ $94 + 109 = 90 = 90$ $94 + 109 = 90 = 90$ $94 + 109 = 90 = 90$ $94 + 109 = 90 = 90$ $94 + 109 = 90 = 90$ $94 + 109 = 90 = 90$ $94 + 109 = 90 = 90$ $94 + 109 = $	
21 + 22 + 23 = 2 - 0 $32 + 23 = -1 - 0$ $41 + 23 = -1 - 0$ $43 = -4$ $43 = -4$ $43 = -4$ $43 = -4$ $43 = -4$ $44 = -4$	10 10 10 11: -4 1 SHOND
21 + 22 + 23 = 2 - 0 $32 + 233 = -1 - 0$ $423 = -4$ $433 = -4$ $34 = -4$ $34 = -$	
21 + 22 + 23 = 2 - 0 $32 + 23 = -1 - 0$ $41 + 23 = -1 - 0$ $43 = -4$ $43 = -4$ $43 = -4$ $43 = -4$ $43 = -4$ $44 = -4$	Warting an the equation form as
92 + 293 = -1 $1493 = -4$	THE PARTY OF A PARTY O
Now, $\alpha + 2\alpha +$	71+27+23 - 2 - 1
Now, $\frac{1}{2}$ and $\frac{1}{2}$	1000 - 4
Eqn (ii) $493 = -4$ $73 = -4$ $94 + 1$ $97 + 2$ 9	Non Signification of the Add
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Fan (III)
$ \begin{array}{ccccccccccccccccccccccccccccccccccc$	1140 (03) 47 (0) (00)
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	472 = -41
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	The state of the s
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	PU++ina 23 90 egn (I)
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	10-10 ACT T - WENT TO CESTIVE !
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	92+293=0+1
$\alpha_2 = -1 + 2$ 560 600	32+2×(-1)=-1
32=1	
	72=1

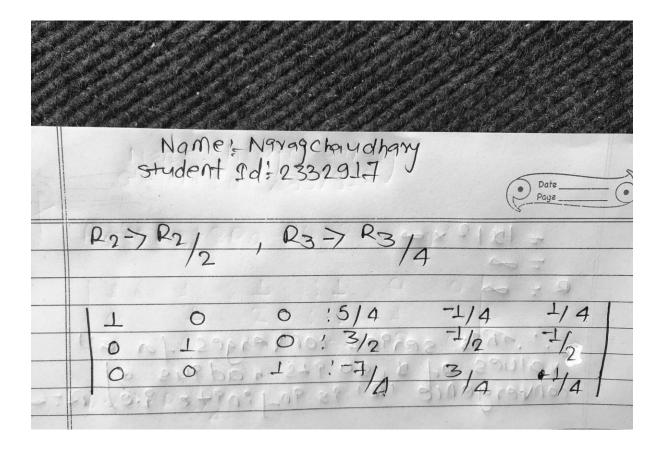


b) Find the inverse of the matrix from (a) using elimination.

(4)

	Name: Naraa chaudhary					
	Stydent 2d 2 2 3 3 2 9 1 7					
	RI - 2 QUARD					
	@'NO!-2b					
	TO 101:100 B					
-	2034:010					
	1 -2 -1:001					
	(Run) 2 Run					
=	$R2 \rightarrow R2 - 2R1$					
	11 121:10 00 1					
	6 1/2:-2 1 0					
	11 -2 -1:00 1					
	R3-7R3-R1					
	12 1 CP 10 3 212 2 2 12					
	12 1 2 1 0 0 1					
	0 -3 -9					
	10 2 2 1 0 10					
-						

Name: - N9rag Chaudhary Student Id; 2332917	
R3-7 R3+3R2 - 298+89 +89	
7 7 7 10 0	
0 1 2 1-2 1 0 - 0	
10.090-7-3 11000	
R2-7 R2x2-R3	
2 / . 2/- 3	
17 1 9 0 7 7 1 0 1 0 1 1	
0 9 00:30-1-10	
10030 8 4 :- 7 3 10	
R1 72 R1-R2 598-094-09	
KJ - / 2 KJ - / 2	
12 10- 2 1:-11 11	
0 2 0 11:30-11-10	
0 0 8 4 : -7 30 10	1
R1-72R1-R3 - 09-19-19	
R1-72R1-R3 - 29-19-19	
14-100 000 08: 35 1-10 111	
0 02 010 01: 3 0-11-10	
0 0 ,843, 1: -7 1 30 10.	
$R_1 \geq R_1$	
R1 > R1/4	
1 0 0 : 5/4 -1/4 -1/4	
0 0 4: -7 30 1	

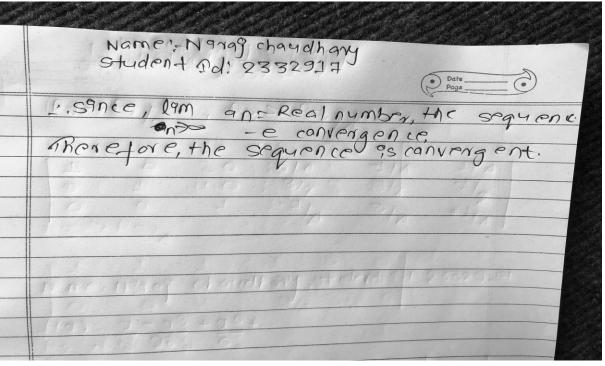


(4)

3. Determine whether the following sequence converges or diverges.

$$t_n = (-1)^{n+1} \, \frac{n+1}{n^2+3}$$

	Name: Navag chaudhary
1	Name: N9199 chaudhary
	Q.NO:-3
4	SOM. + 20 + 20 - 0
	1et. 18 18 14
	tn=9n
	ciant usticaloused to s
	no 12+3
	15110 950+71=2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	lim an = lim n+11(1+05)
	120 NSD 1843
	8+120 1+10(1-) -
	= 19m N+18+92)
	nd ne
	12+3-12 × 8+120
	N2+126 (00100)
	= 19m 11+11 × 1-02-8-000
1715	no por no month
	1+3
	WE WE
1	=0+0=0(24)0(24)0
	1+0



4. Find the Maclaurin series expansion of **Sinx**, also calculate the radius of convergence. (4).

Na	me:-N9499 chaudhary	
	10 - 4	-
Ø.V	10:-4 3(1+0.5) (NON	-
	o. The state of th	
	() = S9ng	
11	$(\alpha) = \cos \alpha$	
4"	(d) = -8900 (1) (1) (D) (2)	
11	1/1/2=-1001	-
11	(1) - 13114	
	19 + 9 12 (9 + 35 Approvings for 20169)	
Now	Walter Andrew Control of the Control	
10	0) = 5900 = 0	
70		
111	o) = coso = 1	
1	01-17-12/1-12/1-12/1-12/1-12/1-12/1-12/1-	
1111	0)= -5910=0	N
7"	0)311/-20	
7"	(0) = - cos 0 = -1	
t in	(0) = 5910=0	
1	A solid for model with contest is	V
117) = 1(0) + a +1(0) + a2 +11(0) + 33 +111(0) +21+	
7	$ = \frac{1!}{(0) + 3!} + \frac{3!}{(0) + 3!} + \frac{3!}{($	
	- 0+x+32,0-x3+x4 0+x5+	
1	$= 0+\alpha+32.0-33+34.0+35+$	

Name: N9ra9 chaudhary, student 12: 28329,17
0 81009
$f(\alpha) = \alpha - \alpha^3 + \alpha^5 + \dots$ (108)
13/12/3/5/
Now,
Radqus of convergence (R)=19m 9n+1
1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
av = (-1)v = 350+7
$(2n+1)_{1}^{2}+(1)_{2}^{2}+(1)_{3}^{2}+($
PARTER ELIGIBLE SON
$a_{n+1} = (-1)^{n+1} a_{2n+3}$
(21+3) 611
(2n + 3) $(2n + 1)$ $(2n + 1)$ $(2n + 1)$ $(2n + 1)$
1) (2n+3); 12n+1
= lim x2n+3-2n-1 x (2n+1):
(2 n+3) (2 n+2) (2 n+1)!
= 12W 25x 7
$n \rightarrow \infty$ $(2n+3)(2n+2)$
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Date Page
$= \alpha ^2 \times \infty = 0$
(Ros) K3/ St. 18 4 8 = 14 8 =
R = 00
THE ALE STATE OF THE STATE OF T
ratures of a, so 9+s + ad 94s of convengence 12, 39 9n jin9+e 9ie 2:0
sings serves converges for all
Values of a, so 9+5 + ad 943 of
convergence 12, 39 901:09+ & 9.6 R-S

The End