- 15	ENGINEERING COLLE	<u>GE</u>
	Complex Integration	
Ø)	Evaluato & 1 do whoso cis the circle 12-11=1.	
		led .
14	1 12-11=110 a circh with contract (10) and radius 1.	
	$Z^{3}-1=(z-1)(z^{2}+z+1)=0$ gives $z=1004$ $z=-1\pm\sqrt{3}i$	
ar in a	The point 2=1 hor incide the coucle and	
_)	The points 2=1 her inside the cords and the points 2=-1+13i his outside =1+15	1
	the circle.) >
	$\frac{1}{(3^2-1)^2} = \frac{91/(2^2+2+1)^2}{(2-1)^2} d_3$	
	$(3-1)^2$ $(2-1)^2$	
	Z=1'e sepoaled lunio	
•	$\frac{1}{C} \int_{(Z-Z_0)^n} (3) = 2\pi i \int_{(N-1)!} (20)$	
and the second s	$\int_{C} \frac{dq}{(z^{2}-1)^{2}} = \int_{C} \frac{1}{(z^{2}+z+1)^{2}} dq$	
	$= 2\pi i \left[\frac{1}{3} \left(\frac{1}{3^2 + 3 + 1} \right)^2 \right]_{z=1} = 2\pi i \left[\frac{-2(2z+z)}{(z^2 + z + 1)^2} \right]_{z=1}$	
	$=2\pi i \left[-2(3) \right] = -4\pi i$ $9.$	
And a state of the		



\$ to	
03	ai elses times ais evolu ins = specific forth mores. Specific in oione = s 1=1e :: oione = s
B2	3 paro.
	그리고 그 그 그 그 그 그 그 그 그 그 그 그 그 그 그 그 그 그
aling energic is the magazing chart of	: z = 010 dg = 1010 do
	<u>보이라고 있는데 하는데 하는데 이번 하는데 하는데 하다. 하는데 하는데 하는데 하는데 하는데 하는데 하는데 하는데 하는데 하는데</u>
	Quasias from 0102π
	$T = \int_{S_{1}} \log \sigma_{10} \cdot i \sigma_{10} d\sigma$
	$I = i \int_{3\pi}^{\pi} i \sigma \cdot \sigma_{i\sigma} d\sigma$
	$T = -\frac{2\pi}{00000000000000000000000000000000000$
	$T = -\begin{bmatrix} 0 \cdot o^{i0} - o^{i0} \end{bmatrix}^{2\pi}$
	1 -1 6
	$T = -\left[\left[-i2\pi \frac{2\pi i}{\sigma} + \frac{2\pi i}{\sigma} \right] - \left[0 + i \right] \right]$
No.	$= \left[\frac{2\pi i}{2\pi i} \left[\frac{1}{2\pi + 1} \right] + 1 \right]$
	Lie was the first the first of the second of
	$T = 2\pi i$
	A Comment of the second of
	4 M 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
A CONTRACT OF THE STREET	

7-17-12



	ENGINEERING COLLEGE
4 03	Engliste January Contra de monda con contra de monda contr
	c) (22-1) ventio 000. 2±1,-2±1
2 552 v na	
1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	$cos(\pi_3) = h(g), h_3 = cos(\pi_3)$ $2^2 - 1 \qquad 2 - 1 \qquad 2 + 1 \qquad -21i \qquad 2ii$
	$2^{2}-1$ $2-1$ $2+1$ $-2,i$ $2,i$
	$At_{8}=1$, $h(1)=cont=-1$
a	
	Ca-(50) = h (0) : hc : -00 (5:)
(a)	$\frac{\cos(\pi_3) = k_3}{2^2 - 1} = \frac{k_3}{3} = \frac{\cos(\pi_3)}{3}$
	At 3=1, KU = cont - 1
	-2 2
E.,	and the second s
	$ \int (3) d3 = \int [-1/2 + 1/2] d3 = [2-1/2 + 1/2] d3 $
15.7	2-1 2+1 0
	The state of the s
3	$= 2\pi i \left -1 + 1 \right $
	1 1 1 1 1 2 2 1 1 d d d d d d d d d d d
	= 0.
T. 4 X.	
1	- S 1 2c 1 1 2 1 1 5 2 2 2 2 2 2 2 2 2 2 2 2 2 2
Been a second	
- 17	
e e e e e e e e e e e e e e e e e e e	



04	(2) = 1
1 - T	
- B4	Lot (3) = 9 + 11 + C + d Z z² z-1 z+2
	$\frac{1}{1-a^{2}(2-1)(z+2)+h(z-1)(z+2)+cz^{2}(z+2)+dz^{2}(z-1)}$
	whom== 1=-2h: h=-1/2
	when 2=-2 1=-12C :. d=-1/12
)——	Equating pourono/23, 0=a+c+d: a=-1+1=-1
	$\frac{3}{42} = \frac{1}{22} = \frac{1}{3(2-1)} = \frac{1}{12(2+2)}$
	·
	When OKIZIKI
	$\frac{1}{42} = -\frac{1}{42} + \frac{1}{22^{2}} = \frac{1}{2} + \frac{1}{2} = \frac{1}{2} + \frac{1}{2} = \frac{1}{2$
	1 4 <u>2</u> 22 ² 3 24 L 2 J
	$= -\frac{1}{4} - \frac{1}{1} + \frac{1}{1+2+2^2+2^3+\dots} - \frac{1}{1-2+2^2-2^3+\dots}$
	42 222 37
121	



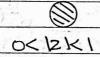
when 15/2/52

$$\sqrt{3} = -\frac{1}{42} - \frac{1}{22^2} + \frac{1}{32} \left[\frac{1-1}{2} \right] - \frac{1}{24} \left[\frac{1+2}{2} \right]$$

when 121>2

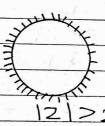
$$\frac{1}{3} = -1$$
 - $\frac{1}{4}$ $\frac{1}{1}$ $\frac{1}{1}$ $\frac{1}{1}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$











05 Using C. R.T sunduate & $e^{\frac{\pi}{2}}$ dz where $e^{\frac{\pi}{2}}$? The poles of $e^{\frac{\pi}{2}}$ are quentry $e^{\frac{\pi}{2}}$? $e^{\frac{\pi}{2}}$ $e^{$
The poles of (3) are gulled by $(z^2 + \pi^2)^2 = 0$ $\therefore (z - \pi i)^2 (z + \pi i)^2 = 0$ $\therefore z = \pi i, \pi i, -\pi i$ Residue of $z = \pi i$ $= 1 \text{Lum of } (z - \pi i)^2 \cdot 0^2$ $1! z > \pi i dz (z - \pi i)^2 (z + \pi i)^2$ $= \lim_{z \to \pi i} \frac{dz}{dz} \left[(z + \pi i)^2 \cdot 0^2 - o^2 (z + \pi i)^2 \right]$ $= \lim_{z \to \pi i} \frac{dz}{dz} \left[(z + \pi i)^2 \cdot 0^2 - o^2 (z + \pi i)^2 \right]$ $= \lim_{z \to \pi i} \frac{2}{(z + \pi i)^2} (z + \pi i)^4$ $= \lim_{z \to \pi i} \frac{2}{(z + \pi i)^2} (\pi i - 1)$ $= \lim_{z \to \pi i} (z + \pi i)^3 (\pi + i) (\pi + i) (\pi + i)$
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
Rosiduo ot $Z = \pi i$ = 1 Lum d [(2-\pi i)^2 \cdot o^2 1! $z > \pi i dz$ [$z - \pi i$)^2 $(z + \pi i)^2$ = Lim db^2 ($z + \pi i$)^2 = Lim $(z + \pi i)^2 \cdot o^2 - o^2$ ($z + \pi i$)\cdot of $z > \pi i dz$ [$z + \pi i$)\decorpoondark = Lim e^2 ($z + \pi i$)\decorpoondark = $z > \pi i$ ($z + \pi i$)\decorpoondark = $z = \pi i$ ($z + \pi i$)\decorpoondark = $z = \pi i$ ($z + \pi i$)\decorpoondark = $z = \pi i$ ($z + \pi i$)\decorpoondark = $z = \pi i$ ($z + \pi i$)\decorpoondark = $z = \pi i$ ($z + \pi i$)\decorpoondark = $z = \pi i$ ($z = \pi i$) = $z = \pi i$ ($z = \pi i$) = $z = \pi i$ ($z = \pi i$) = $z = \pi i$ ($z = \pi i$) = $z = \pi i$ ($z = \pi i$) = $z = \pi i$ ($z = \pi i$)
$= \frac{1}{1!} \lim_{z \to \pi_i} \frac{d}{dz} \left[\frac{(z - \pi_i)^2}{(z - \pi_i)^2} \frac{z}{(z + \pi_i)^2} \right]$ $= \lim_{z \to \pi_i} \frac{d}{dz} \left[\frac{(z + \pi_i)^2}{(z + \pi_i)^2} \right] = \lim_{z \to \pi_i} \frac{(z + \pi_i)^2}{(z + \pi_i)^4}$ $= \lim_{z \to \pi_i} \frac{e^2}{(z + \pi_i)^3} \frac{(z + \pi_i)^3}{(z + \pi_i)^3}$ $= e^{\pi_i} 2i (\pi + i) = -e^{\pi_i} (\pi + i) = (\pi + i)$
$= \frac{1}{1!} \lim_{z \to \pi_i} \frac{d}{dz} \left[\frac{(z - \pi_i)^2}{(z - \pi_i)^2} \frac{z}{(z + \pi_i)^2} \right]$ $= \lim_{z \to \pi_i} \frac{d}{dz} \left[\frac{(z - \pi_i)^2}{(z + \pi_i)^2} \right] = \lim_{z \to \pi_i} \frac{(z + \pi_i)^2}{(z + \pi_i)^4}$ $= \lim_{z \to \pi_i} \frac{e^2}{(z + \pi_i)^3} \frac{(z + \pi_i)^3}{(z + \pi_i)^3}$ $= e^{\pi_i} 2i (\pi + i) = -e^{\pi_i} (\pi + i) = (\pi + i)$
$\frac{z - \pi i}{z - \sigma^{\pi} i} \frac{(z + \pi i)^3}{(\pi + i)} = \frac{(\pi + i)^3}{(\pi + i)} = \frac{(\pi + i)^3}{(\pi + i)}$
$\frac{z - \pi i}{z - \sigma^{\pi} i} \frac{(z + \pi i)^3}{(z + \pi i)^3} = \frac{(z + \pi i)^3}{(z + \pi i)^3}$
$= o^{\pi i} 2i(\pi + i)^{3} \qquad (5\pi \pi i)^{3}$ $= o^{\pi i} 2i(\pi + i) = -o^{\pi i}(\pi + i) = (\pi + i)$
$= o^{\pi i} 2i(\pi + i) = -o^{\pi i}(\pi + i) = (\pi + i)$ $-8\pi^{3}i \qquad \forall \pi^{3} \qquad \forall \pi^{3}$
-8 H3 4 H3 4 H3
- 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1
Rosidus at Z=-Ti
H=11+ d[S+11)2.02
1! 27-11; 02 (2+11)2
= Limit of $\begin{bmatrix} 0^2 \end{bmatrix}$ = Limit $\begin{bmatrix} 2-\Pi i \end{bmatrix}^2 \begin{bmatrix} 0^2 - 0^2 (2-\Pi i)^2 \end{bmatrix}$ $Z > \Pi i$ $Z = \begin{bmatrix} 2-\Pi i \end{bmatrix}^2 \begin{bmatrix} 2-\Pi i \end{bmatrix}^2 \begin{bmatrix} 2-\Pi i \end{bmatrix}^2$ $Z > \Pi i$ $Z = \begin{bmatrix} 2+\Pi i \end{bmatrix} $
2211 d2 (2+11) 1 (2+11) 4
= Limit (= (2-11-2) = e (1 (-2#i-2)
$\frac{27-111}{2-\pi i} \frac{(-2\pi i)^3}{(-2i)(\pi-i)} = \frac{-\pi i}{(\pi-i)} = \pi-i$
1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -
8π ³ i 4π ³
Data Ordin Ori Tarin + Til
2009(a) (S = 211) 11+1 T 11-1 = 1 UT3 473 TT