

Put
$$x^2-1=0$$

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 $\Rightarrow x=\pm\pm$

(iii) log $(x-2)=f(x)$
 $x-2=0\Rightarrow x=2\Rightarrow$ Becauch point

Bereanch Cut:

A beconch cut is position of a cline or curve that is introduced in order to define a branch F' of a multi-valued Junction of foints on the branch cut for F was singular points of F, and any point Common to all branch cut is called becauch point.

C.g. (i) $f(x)=x^2$
 $(x-1)^2(x+3)$

To colculate poles

Lim $(x-x_0)^n f(x)=non-zero constant$
 $x+x_0=1,3 \rightarrow pole$

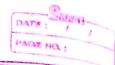
(ii) $f(x)=tanx$
 $f(x)=tanx$
 $cosx$

At $x=x_0 \rightarrow pole$

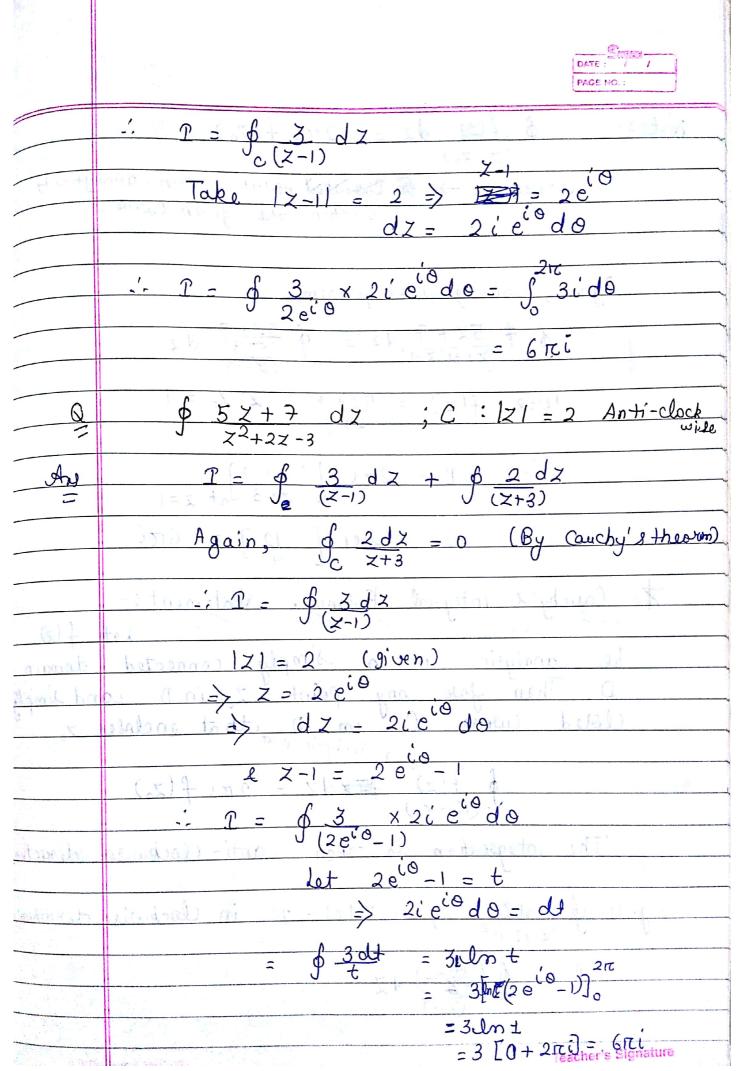
But within $c:|x|=1 \rightarrow cost have $nost pole$.

[But we have Zeros at $x=0$]

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()	i) $f(z) = \frac{\sin z}{\cos z}$ $C_1: z = 3$
	C2: \$\frac{1}{2} + \frac{1}{2} = 1
	Within C, > there is a pole at Z=15
	$C_2 \rightarrow \frac{\chi^2}{16} + \frac{y^2}{9} = 1$
	\$ Pole at x = \$(2K+1) \(\frac{1}{2} \)
	For within C,
L A L	
01 1	$\left[\frac{(2R+1)}{2}\right]^{2}+0\leq 1$
- 0	6
A	$\Rightarrow (2K+1)^2 \leq \frac{64}{K^2}$
7.00	K→O => Z=II [Pole]
	Evaluate & 52+7 dz
=	Evaluate $\int_{C} 52+7 dz$
	whore C: 17-11-2 1
	where C: z-1 =2 traversed anti-clockwise
Ans	$ \int 57 + 8 $
	(10)
	It so has two isolated singularities at $z=1$
	+2=-3, but $Z=1$ is in Circle 8
	C: z-1 = 2.
	neovem
	Jo Z+3 = 0 [As Analytic within
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	100 mon 201 or the last reference to the
2 4 7 31 24	



T = 6 (Ca) x) d z

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	Here f(x) = Cos x ; x=1
	$= -2\pi i f(1) = -2\pi i \frac{\text{Col} 4}{\text{e}}$
	(-ve sign because it is teroversed clockwise discortion)
($T = \int \frac{Z}{Z^2 - \pi^2} dZ$
	C: z-1 = 1 anti-clockwise
Ans	$ \frac{\int Z}{(Z-\pi)} (Z+\pi) dZ $
	We have peroblem with X=+10 in terms of
Ĭ.	But $z = -tc$ does not lie within C.
	$f(z) = Z$ $(z+\pi)$
(3)	$50, \Gamma - 2\pi i \times f(\pi) = 2\pi i \times \pi$
5.6	$=\pi$
in the Chi	is $T = \int_{C} \frac{e^{z}}{(z^{2})} dz$; $C: z = 2$ anti-clockwise
An	$\frac{T-\int e^{z} dz}{(z-i)(z+i)}$
	$= \oint \frac{e^{z}}{2(z-1)} dz - \oint \frac{e^{z}}{2(z+1)} dz$
	$= 2\pi i e' - 2\pi i e'$
	= πι (e'-e) Teacher's Signature

(iv)
$$T = \oint_{c} \frac{2Z + SinZ}{(Z-1)^3}$$
 C: $|Z| = \pi$

of Cauchy's integral yormula:-

Let 'c' be closed curve with center

$$f(z) = f(z) - f(z_0) + f(z_0)$$

$$\oint \frac{f(z)}{(z-z_0)} dz = \oint \frac{f(z)}{(z-z_0)} - \frac{f(z_0)}{(z-z_0)} + \frac{f(z_0)}{(z-z_0)} dz$$

$$= \oint f(z) - f(z_0) dz + \oint f(z_0) dz$$

$$= (z-z_0) \qquad c (z-z_0)$$

$$= \oint_{C} \frac{f(z) - f(z_0)dz + f(z_0)}{(z - z_0)} dz + f(z_0) 2\pi i - 0$$

$$\frac{\left[\frac{1}{2} + \int_{C} (x-z_{0})^{-1} dx\right]}{\left[\frac{1}{2} + \int_{C} (x-z_{0})^{-1} dx\right]}$$

Restrugarea

$$(i,j)$$
 $| \sum (x_1 + x_2 + x_3 + ...) | \leq \sum (|x_1| + |x_2| + |x_3| + ...) |$

$$(iii)$$
 $\int_{C} f(z) dz \leq \int_{C} |f(z)| dz$

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(z) ús continuous
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$\hat{x} = \hat{x}$
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 $| \oint f(x) - f(x_0) | dx | \leq 2\pi \mathcal{E}$ When $\mathcal{E} \to 0$ We get, $| \oint f(x) - f(x_0) | = 0 \qquad [By ci) \text{ property}]$ $| (x - x_0) |$ $| \text{in } \mathbb{Q}$

 $\int \frac{f(z)}{(z-z_0)} dz = f(z_0) \times 2\pi i \rightarrow H \cdot P$

Using (iii) property,

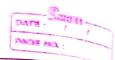
Definition -> [f(x)-f(z)]

 $\frac{f(x)-f(x_0)}{(x-x_0)}$

\$ f(z) - f(zo) dz

f(z) is analytic

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Generalized your of Cauchy's integral - not solvable by C. I. F. you all I inside and or (eacher's Signature

