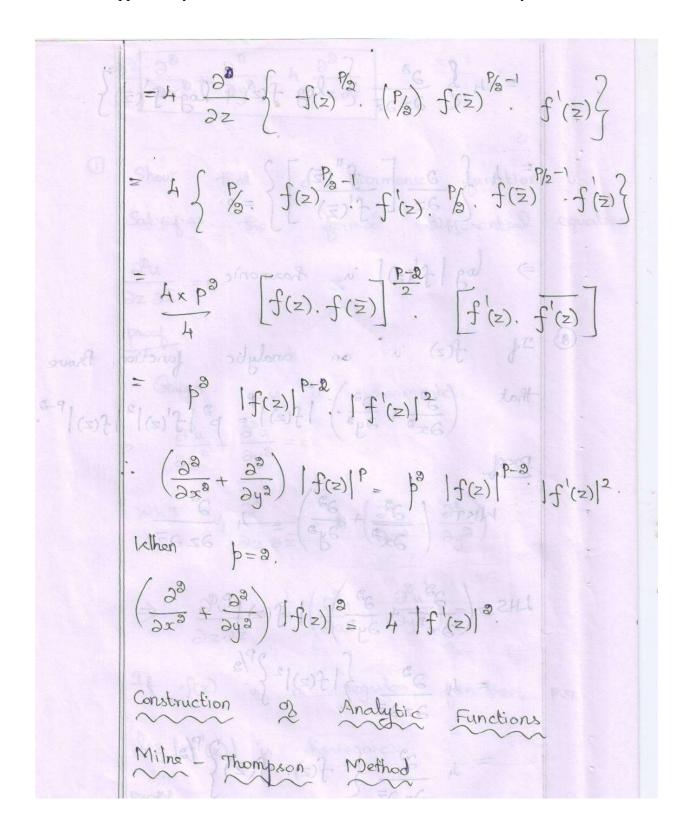


Kurumbapalayam (Po), Coimbatore – 641 107



AN AUTONOMOUS INSTITUTION

Accredited by NAAC - UGC with 'A' Grade



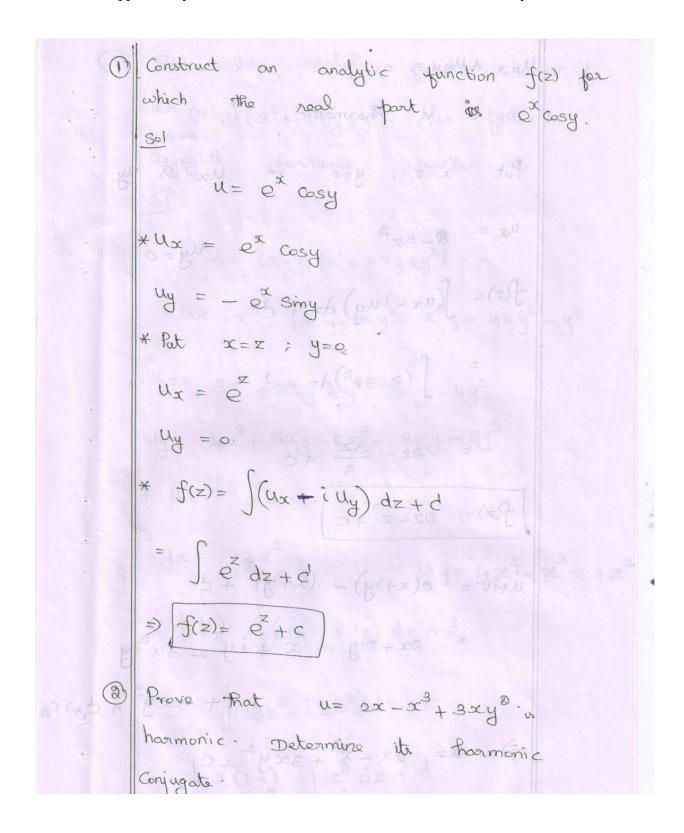


Kurumbapalayam (Po), Coimbatore – 641 107



AN AUTONOMOUS INSTITUTION

Accredited by NAAC – UGC with 'A' Grade





Kurumbapalayam (Po), Coimbatore – 641 107 **AN AUTONOMOUS INSTITUTION**



Accredited by NAAC – UGC with 'A' Grade



Kurumbapalayam (Po), Coimbatore – 641 107 **AN AUTONOMOUS INSTITUTION**



Accredited by NAAC – UGC with 'A' Grade

	ń.
3	Find the analytic function utiv if
5.7[9	$u = (x-y)(x^2 + 4xy + y^3)$. Also find the Conjugate harmonic function v .
	$\frac{801}{200} = \frac{8}{100} = \frac{8}{100} = \frac{8}{100} = \frac{8}{100} = \frac{1}{100} = $
	$u = x^{3} + 4x^{3}y + xy^{2} - x^{3}y - 4xy^{2} - y^{3}$ $x = x^{3} + 4x^{3}y + xy^{2} - x^{3}y - 4xy^{2} - y^{3}$
	$4x = 3x^{3} + 8xy + y^{3} - 2xy - 4y^{2}$ $4y = 4x^{3} + 8xy - x^{3} - 8xy - 3y^{2}$ $4x = 3x^{3} + 8xy + y^{3} - 2xy - 4y^{2}$ $4x = 3x^{3} + 8xy + y^{3} - 2xy - 4y^{2}$ $4x = 3x^{3} + 8xy + y^{3} - 2xy - 4y^{2}$ $4x = 3x^{3} + 8xy + y^{3} - 2xy - 4y^{2}$ $4x = 3x^{3} + 8xy + y^{3} - 2xy - 4y^{2}$
	* Put $8x = z \neq y = 0$ * Put $8x = z \neq y = 0$ * All $y = 3z^2$ * All $y = 4x^2 - x^2 = 3x^2$
	$f(z) = \int (ux - iuy) dz + d$
	$= \int (3z^{3} - i3z^{3}) dz + d$ $= 3(1-i) \int z^{3} dz + d$



Kurumbapalayam (Po), Coimbatore – 641 107 **AN AUTONOMOUS INSTITUTION**



Accredited by NAAC – UGC with 'A' Grade

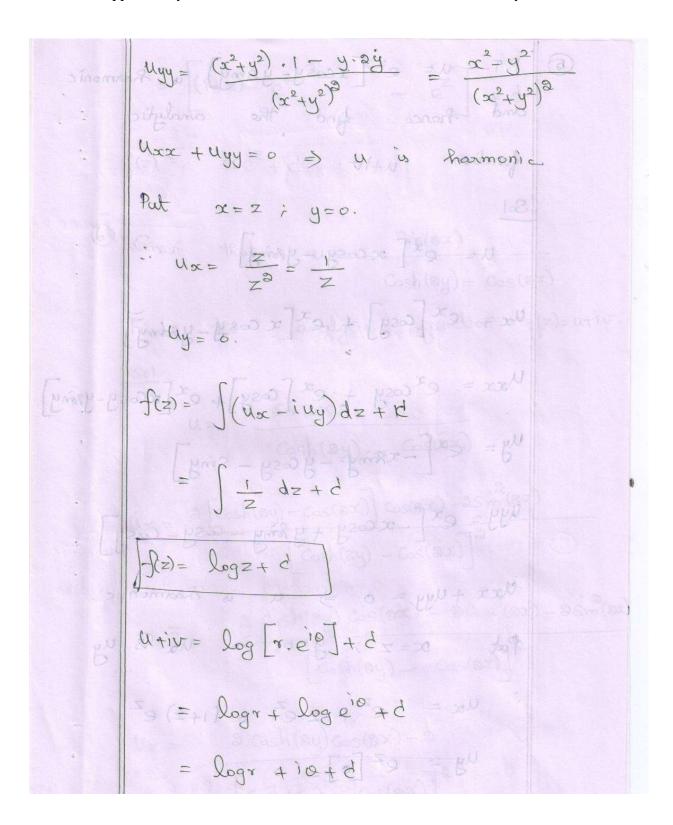
di vi	utiv= (1-i) (xtig) + d of 6m7 (8)
Lari	$= (1-i) \left[\alpha^3 - iy^3 + 3\alpha^3 iy + 3\alpha y^3 \right] + d$
	$u_{+iv} = x^3 - iy^3 + 3x^3iy - 3xy^3 - ix^3$
	-y3 + 3xy + i xy3 + C1 + i C2
7	
	$v = -y^3 + 3x^2y - x^3 + xy^3 + c_2$
(A)	Show that $u = \frac{1}{2} \log(\alpha^2 + y^2)$ is harmonic. Determine its analytic function.
Z = 3Z	Junction. Also find its conjugate.
	S_{0} $U = \frac{1}{2} \log (x^{2} + y^{2})$
	Un = 1 = 6 g x 8 5 _ 5 2 } = x = x = x = x
	$\frac{3}{3} + \frac{x^2 + y^3}{x^2 + y^3} + \frac{x^2 + y^3}{x^2 + y^3}$



Kurumbapalayam (Po), Coimbatore – 641 107 **AN AUTONOMOUS INSTITUTION**



Accredited by NAAC - UGC with 'A' Grade





Kurumbapalayam (Po), Coimbatore – 641 107 **AN AUTONOMOUS INSTITUTION**



Accredited by NAAC – UGC with 'A' Grade

6 P.T.
$$u = e^{x} \left[x \cos y - y \sin y \right]^{-1} = Ranmonic$$
and hence find the analytic
function $u + iv$.

Sol

 $u = e^{x} \left[x \cos y - y \sin y \right]$
 $u_{xx} = e^{x} \left[\cos y \right] + e^{x} \left[x \cos y - y \sin y \right]$
 $u_{xx} = e^{x} \left[\cos y \right] + e^{x} \left[\cos y \right] + e^{x} \left[x \cos y - y \sin y \right]$
 $u_{yy} = e^{x} \left[-x \sin y - y \cos y - \sin y \right]$
 $u_{yy} = e^{x} \left[-x \cos y + y \sin y - \cos y - \cos y \right]$
 $u_{xx} + u_{yy} = 0 \Rightarrow u \text{ is } Ranmonic$

Put $u_{xx} = v_{xx} + v_{yx} = 0 \text{ in } u_{xx} \text{ is } u_{yx}$
 $u_{xx} = e^{x} + v_{xx} = (1+z) e^{x}$
 $u_{xx} = e^{x} + v_{xx} = (1+z) e^{x}$

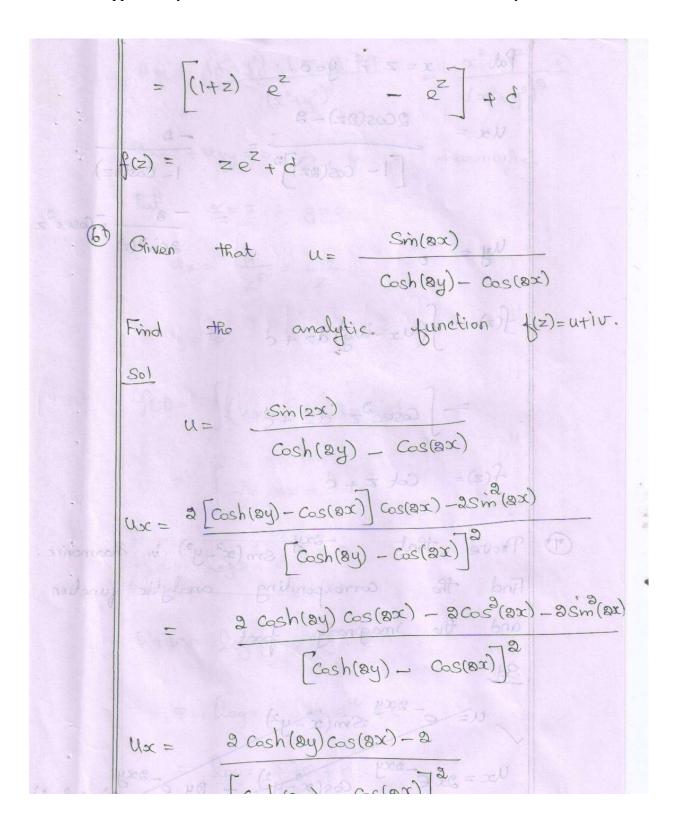


Kurumbapalayam (Po), Coimbatore – 641 107





Accredited by NAAC - UGC with 'A' Grade



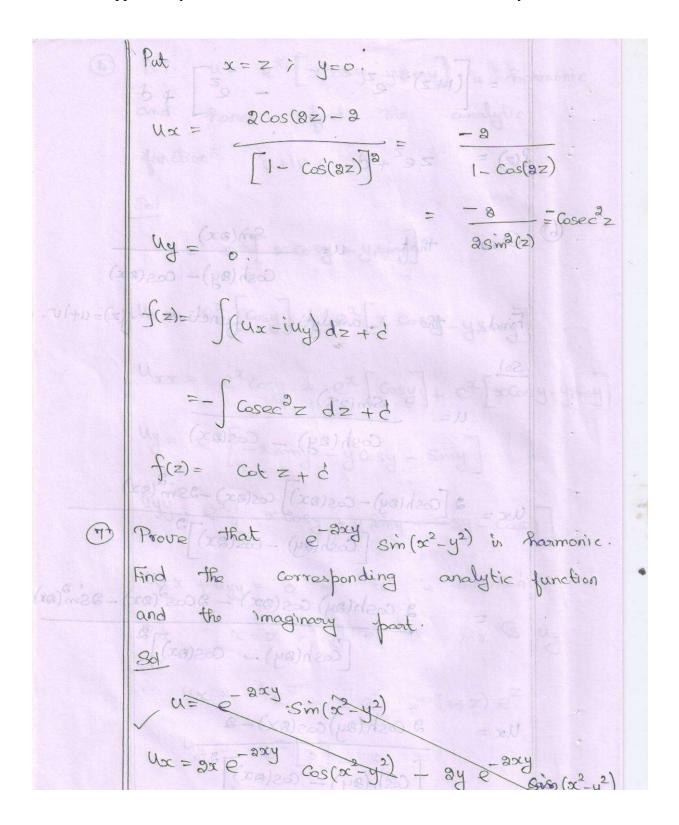


Kurumbapalayam (Po), Coimbatore – 641 107



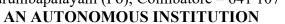
AN AUTONOMOUS INSTITUTION

Accredited by NAAC – UGC with 'A' Grade





Kurumbapalayam (Po), Coimbatore – 641 107





Accredited by NAAC - UGC with 'A' Grade

$$f(z) = \int (ux - iuy) dz + d$$

$$= \int \left[3z \cos(z^3) + 3iz \sin(z^3) \right] dz + d$$

$$= \partial \int z \left[\cos(z^3) + i \sin(z^3) \right] dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$

$$= \partial \int z \cdot e^{iz^3} dz + d$$



Kurumbapalayam (Po), Coimbatore – 641 107 **AN AUTONOMOUS INSTITUTION**



Accredited by NAAC - UGC with 'A' Grade

$$u+iv = -i e^{-3xy} \left[\cos(x^2-y^2) + i \sin(x^2-y^2) \right] + d$$

$$V = -e^{-3xy} \cos(x^2-y^3) = 0$$

$$Type (a) - Imaginary part V is given
(i) Find V_{∞} and V_{y}
(ii) Find V_{∞} and V_{y}
(ii) Fit $x = z$ and $y = 0$.
$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

$$V(i) = \int (V_{y} + i V_{\infty}) dz + d$$

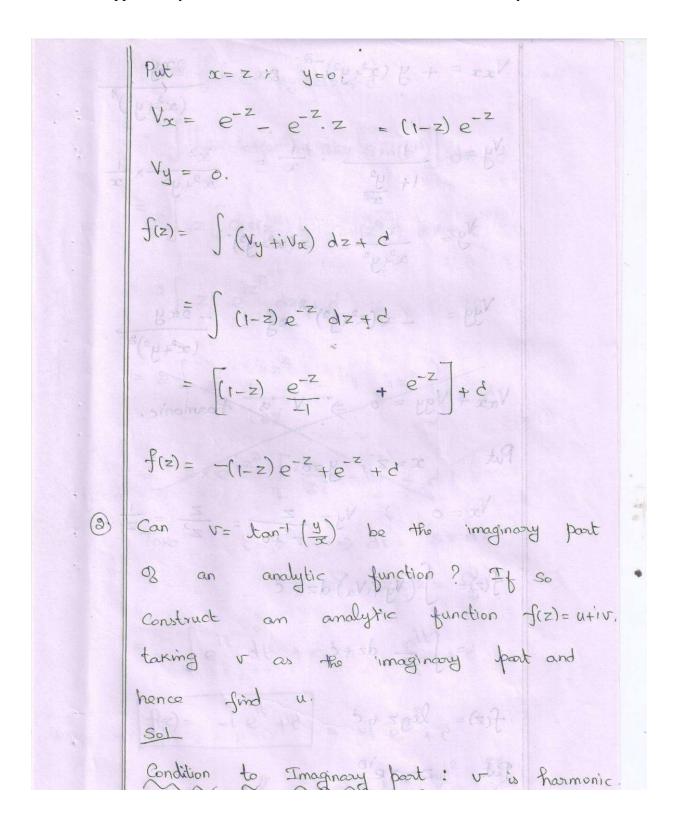
$$V(i) = \int (V_{y} + i V_{\infty}) dz$$$$



Kurumbapalayam (Po), Coimbatore – 641 107 **AN AUTONOMOUS INSTITUTION**



Accredited by NAAC – UGC with 'A' Grade



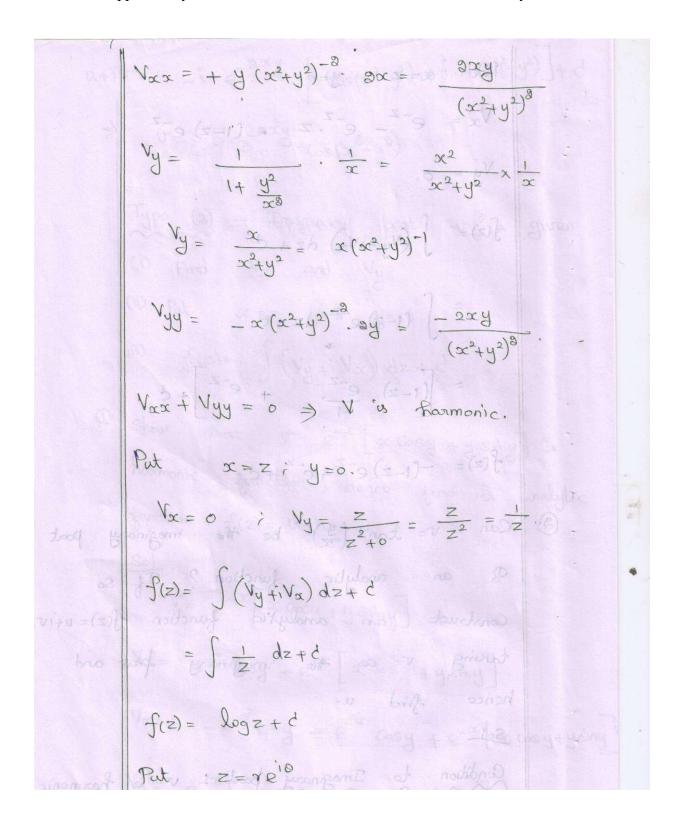


Kurumbapalayam (Po), Coimbatore – 641 107



AN AUTONOMOUS INSTITUTION

Accredited by NAAC – UGC with 'A' Grade





Kurumbapalayam (Po), Coimbatore – 641 107



AN AUTONOMOUS INSTITUTION

Accredited by NAAC - UGC with 'A' Grade

$$U = \log x = \frac{1}{2} \log(x^2 + y^2)$$

$$V = 0 = \tan^{-1}(\frac{y}{x}),$$

$$V = \log(x^2 + y^2) + x - 3y.$$

$$V = \log(x^2 + y^2) + x - 3y.$$

$$V = \frac{3x}{x^2 + y^2} + 1$$

$$V = \frac{3y}{x^2 + y^2} - 3$$

$$V = \frac{3z}{z^2} + 1 = \frac{3}{z} + 1$$

$$V = -3$$

$$\int (z) = \int (v_y + iv_x) dz + d$$

$$\int (z) = -3z + 3i \log z + iz + d$$

$$Tupe (3) = u - v \text{ is given}$$

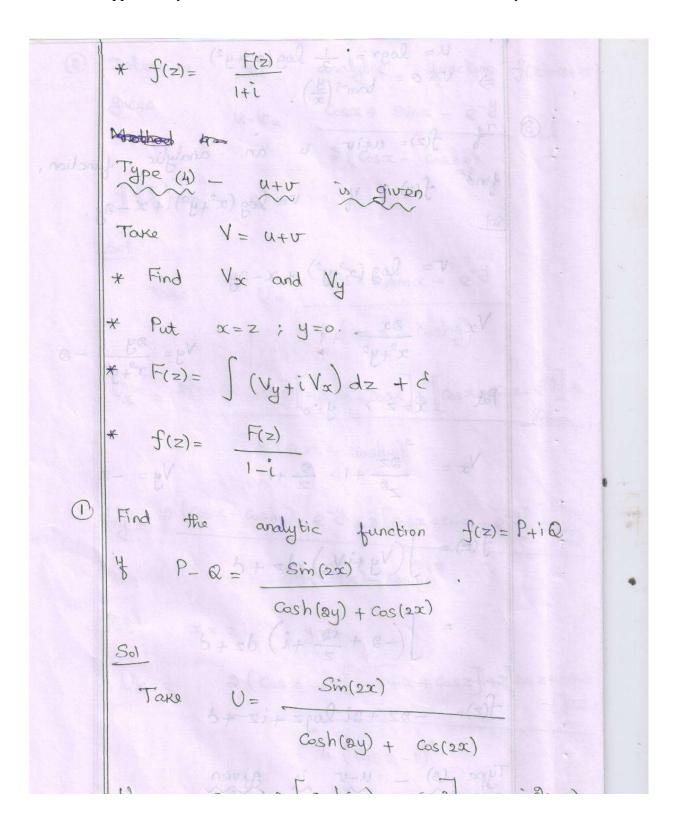


Kurumbapalayam (Po), Coimbatore – 641 107



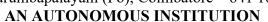
AN AUTONOMOUS INSTITUTION

Accredited by NAAC - UGC with 'A' Grade



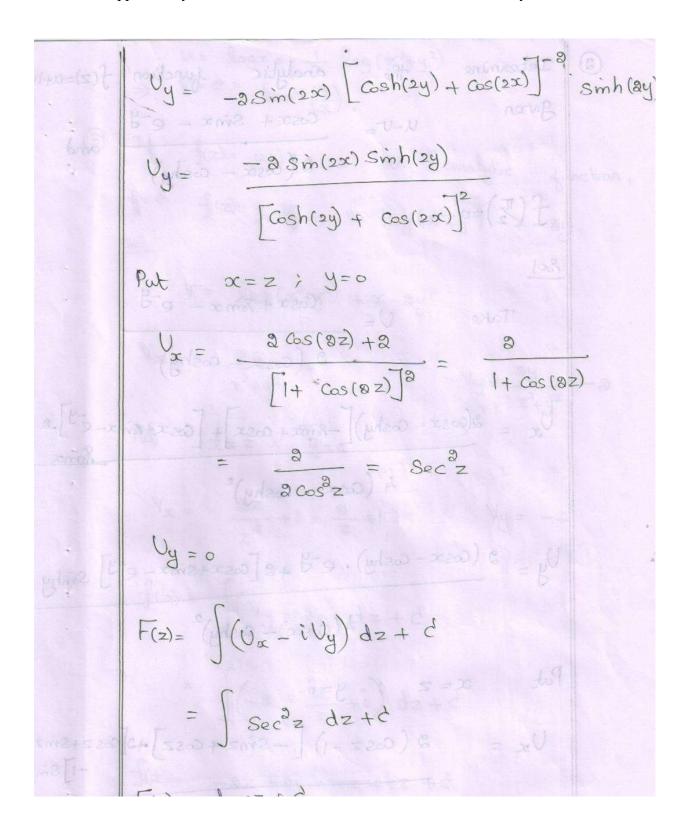


Kurumbapalayam (Po), Coimbatore – 641 107





Accredited by NAAC - UGC with 'A' Grade

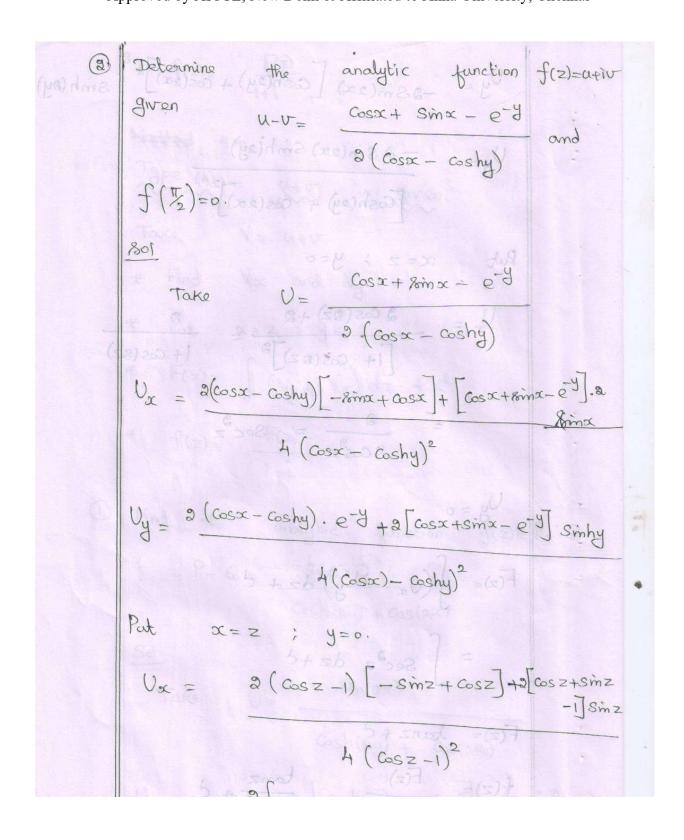




Kurumbapalayam (Po), Coimbatore – 641 107



AN AUTONOMOUS INSTITUTION Accredited by NAAC – UGC with 'A' Grade





Kurumbapalayam (Po), Coimbatore – 641 107



AN AUTONOMOUS INSTITUTION

Accredited by NAAC - UGC with 'A' Grade

$$H(\cos z) = \frac{1}{2 \times 3 \sin^{3}(z)}$$

$$H(\cos z - 1)^{2} = \frac{1}{3 \times 3 \sin^{3}(z)}$$

$$U_{y} = \frac{3(\cos z - 1)}{4(\cos z - 1)^{2}} + \frac{3(\cos z + \sin z - 1)}{4(\cos z - 1)^{2}}$$

$$H(\cos z - 1)^{2} = \frac{3(\cos z - 1)}{4(\cos z - 1)^{2}} + \frac{3(\cos z - 1)}{3 \times 3 \sin^{2}(\frac{z}{2})}$$

$$H(\cos z - 1)^{2} = \frac{-1}{3 \times 3 \sin^{2}(\frac{z}{2})}$$

$$U_{y} = \frac{-1}{4 \sin^{2}(\frac{z}{2})} = \frac{-1}{4 \cos^{2}(\frac{z}{2})} + \frac{1}{4 \cos^{2}(\frac{z}{2})}$$

$$F(z) = \int (U_{x} - i U_{y}) dz + d$$

$$= \int \frac{1}{4} (1 + i) \int (\csc^{2}(\frac{z}{2}) + \frac{i}{4} \cos^{2}(\frac{z}{2}) dz + d$$



Kurumbapalayam (Po), Coimbatore – 641 107



AN AUTONOMOUS INSTITUTION

Accredited by NAAC - UGC with 'A' Grade

$$f(z) = \frac{F(z)}{|+i|}$$

$$f(z) = \frac{-1}{2} \cot\left(\frac{z}{2}\right) + \frac{C}{1+i} = \frac{-1}{2} \cot\left(\frac{z}{2}\right) + C_1$$

$$Take z = \frac{1}{2}$$

$$0 = \frac{-1}{2} \cot\left(\frac{z}{2}\right) + C_1$$

$$= \frac{-1}{2} + C_1 \Rightarrow C_1 = \frac{1}{2}$$

$$\therefore f(z) = \frac{-1}{2} \cot\left(\frac{z}{2}\right) + \frac{1}{3}$$

$$\therefore f(z) = \frac{-1}{2} \cot\left(\frac{z}{2}\right) + \frac{1}{3} \cot\left(\frac{z}{2}\right) +$$



Kurumbapalayam (Po), Coimbatore – 641 107 **AN AUTONOMOUS INSTITUTION**



Accredited by NAAC – UGC with 'A' Grade

11	
	= (1+i) etc Invaiont of bad (1+i) =
	agus not am down to Sale
	$\Rightarrow f(z) = \frac{F(z)}{1+i}$
Ry or	$\Rightarrow f(z) = e^{z} + \frac{c}{1+i}$
	Transformation
	A Complex valued function 8
	complex variable $w = f(z)$ can be
	treated as a transformation or points
	08 I-plane into points of W-plane.
1486	20 80 daying & thousand of bail (8)
1.45	Invariant or Fixed point
	The invariant (or) fixed points of
Fig.	the transformation $w = f(z)$ is given by
	Solving the equation $Z = f(z)$.
	3+20 = 22+3- <
0	Find the invariant points of z3.
	Sol