complen Analysis
DATE
2 016 PAGE NO
301 v(n,y) = n3 - 3my2 + 2y
$\frac{\partial o}{\partial n} = 3n^2 - 3y^2 \qquad \frac{\partial^2 o}{\partial n^2} = 6n$
3n 3y 3n = 6n
20 = -6 my + 2 32.062.
30 = -6 my + 2 320 = -6n
$\frac{9n_5}{5\sigma} + \frac{8d_5}{5\sigma} = 0$
0 N 2 8 4 2
- v(n,y) is Harmonic function
Let u(x, y) be Harmonic Conjugate.
du = -6 ry + 2
3u = -3 n2 + 342
$u = -3n^2y + 2n + f(y)$
$\frac{\partial u}{\partial x} = -3x^2 + f'(y)$
89
$-3n^2 + f'(y) = -3n^2 + 3y^2$
$f'(y) = 3y^2$
1(9) = 39
$f(y) = y^3 + c$
:. u(x,y)=-3x24 + on+43+c
Analytic function.
f(u,u) = u + iu = $(-3n^2y + y^3 + 2n) + i(n^3 - 3ny^2 + 2n)$
= (-3xy+g-+2x)+c(r-3xy+2y)
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27.1
De 4(t)=e2xit osts1
4 (t) = (6)22 t + i sin 2 2 t 18 50 500
let 21
e = y(0) = coso + i sur a o c o c 2 > = =
= 618
$\frac{d^2}{dz^2-1} = \frac{d^2}{dz^2-1}$ where c in
J42'-1 6 422-1 121=1
Z=ei0 060622
So Here of f(x) d2
<u></u>
$f(z) = 1$ $4z^2 - 1$
422-1
f(z) has two poles 422-1=0
2-+1/2
Boter tuese lies inside circle.
··· Residue at $z=1/2$
0, 1 2-1/2 Hz = 0, 1 = 1
$\lim_{z \to 1/2} (z^{-1/2}) f(z) = \lim_{z \to 1/2} \frac{1}{z + 1/2} = 1$
<u> </u>
Residue at $z = -1/2$
lun (2+1/2) f(2) = lun 1 = -1
$\lim_{z \to -1/2} \left(\frac{z + 1/2}{z} \right) f(z) = \lim_{z \to -1/2} \frac{1}{z^{-1/2}} = -1$
feron Cauchy's Residue theorem.
$\int f(z) dz = 2 \pi i \xi R$
$\int f(z) dz = 2 \pi i \xi R^{\dagger}$ $= 2 \pi i (1-1)$
- 0
(dz - >)
$\int \frac{dz}{4z^2-1} = 0$
1 4 72
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