Applied Calculus
Integration by Substitution: Magic Substitution Method: function rational form or trignometric form mai ho Z = tan n 2
dz = 1 sec ² M dn 2 2
2dz = sect n dn
$1 + \tan^2 \theta = \sec^2 \theta$ $dx = 2 dx$ $\sec^2 \pi/2$
$\frac{dn^2}{1+tan^2\frac{y}{2}}$
dn = 2dz (integral operator)

Colodiec Sin 2x = 2 sin 4 Cos X Sin M 2 Sin M COS M Sin x = 2 sin 11/2 cos 11/2 x cos 11/2 cos x/2 2 fan n cos²n 2 tan 11/2 sec 2 11/2 2 tan 4/2 1+ tan2 x/2 .. Z = tan 1/2 2 = tan2 1/2 Sin1 = 22 (sin oper operator) cos 8 :-(: cos 20 = 20030-1 COSX = 2 COS 1 -1 2 Sec 1/2 cos x . 2 3ec2 x/2. cos0 = 1 cos x = 2 1+ tan2 x (: sec 0 = 1 + tan 0

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COS N ==
 COSX 2
Problem #1: 8-
   [2 - cosn ) dn
   12+ COSX
  2 - (1-22) /1+22 | 2dz
    3+322+22+24 (22+3) (22+1)
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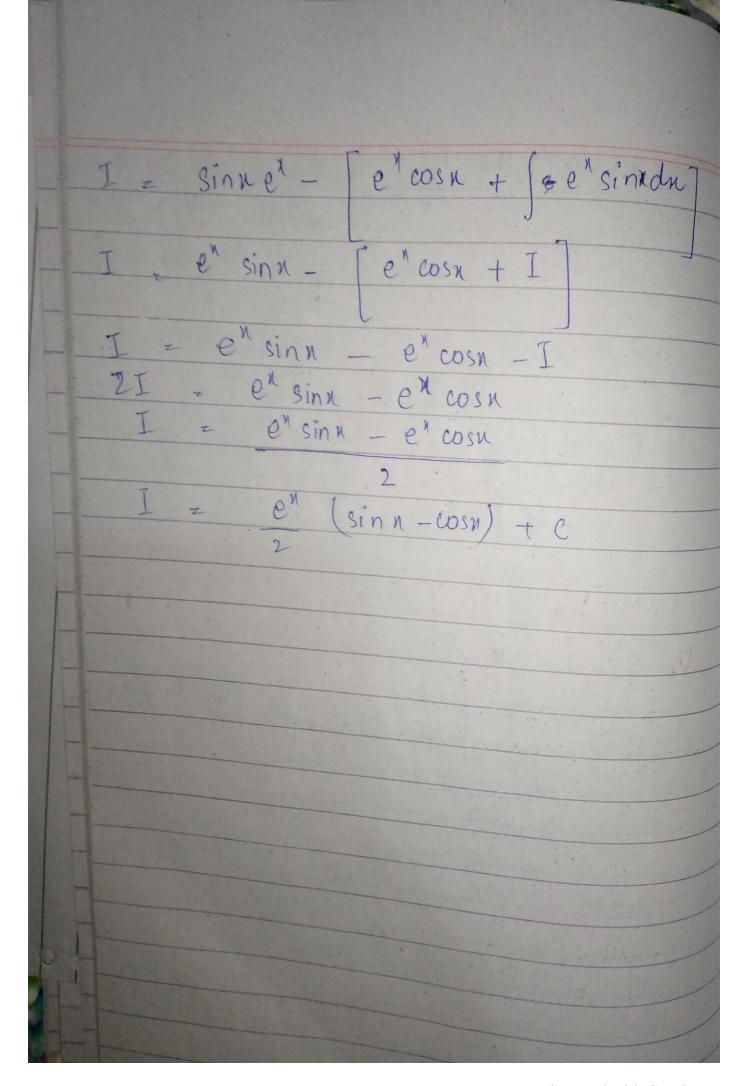
let z²= li
3z2 + 1 2 3U+1
$(2^{2}+3)(z^{2}+1)$ $(U+3)(U+1)$
3U+1 = A + B
(U+3)(U+1) $U+3$ $U+1$
3U+1 = A (U+1) + B (U+3)
Pat U+1 =0
Uz -1
-3(-1)+1=A(-1+3)
-3 +1 z 2B
-2 2 B
-1: z B
Put U+3 = 0
U = -3
3(3) +1 = 2 A (3+1) + B (-8+B)
-9+1 = A(-91)
-8-2-9A
4 = A
3U+1 = 4 = B1
[U+3)(U+1) U+3 U+1

Itsinn (2) 1-sink Integration by Parts:

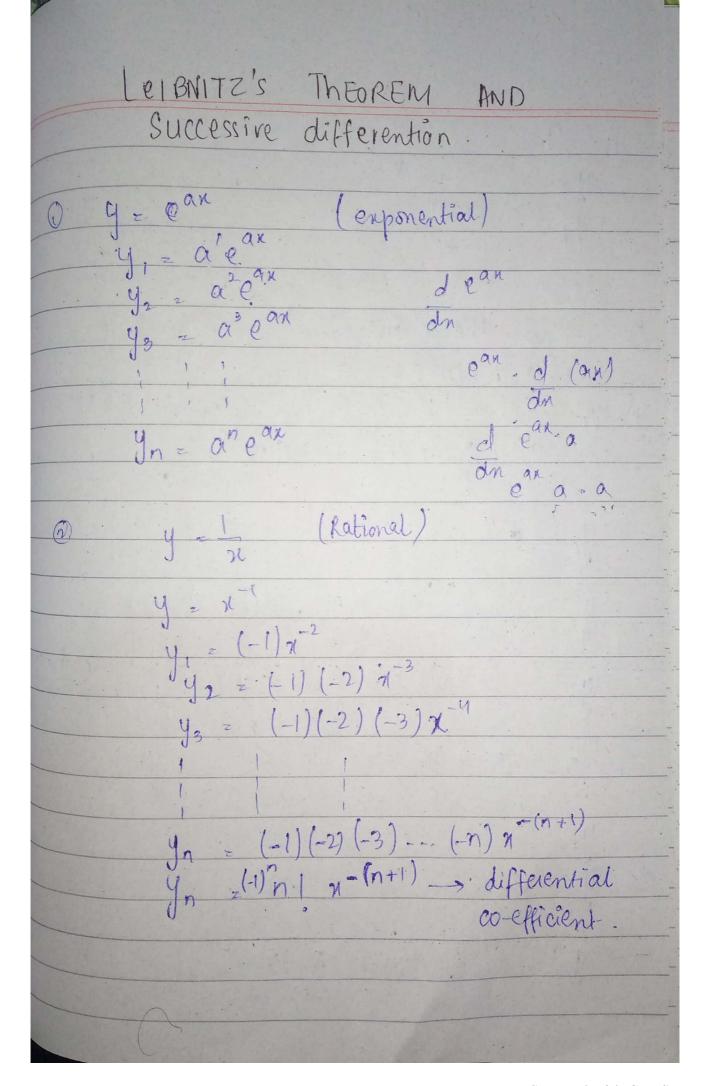
If f(n) & g(n) are two functions.

U=f(n), v= &g(n). [(UV) dv = U | Vdv - [(U') Vdv) dv Inn du U= Mx, V=1 I handr = han I da - [] da da = xlmn - [] - xg dx 2 Nlnn - jkdn landa = nlnn - n +c

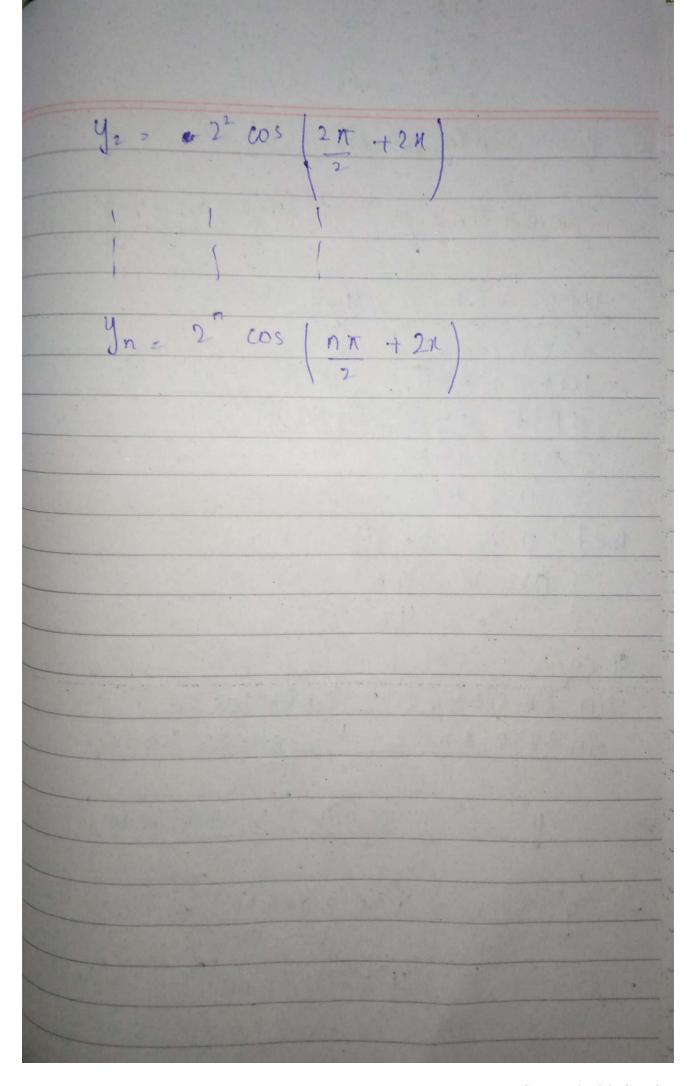
Je" sin (e") dr Agr function to deviation to mojood hot integrated moi to function to integral integral garenge gareng du = ex dn Sin v du - cosu + c = - cos (e") + c. Q Iz et sinndr Vz en ; V= Sinn l'ersinn du = en sinn du en sinnan Jensinn dn = sinn Jendn - Jeosn Jendn dn sinner - [cosner dr Sin en - [cosa en - [(-sina) fenda) da

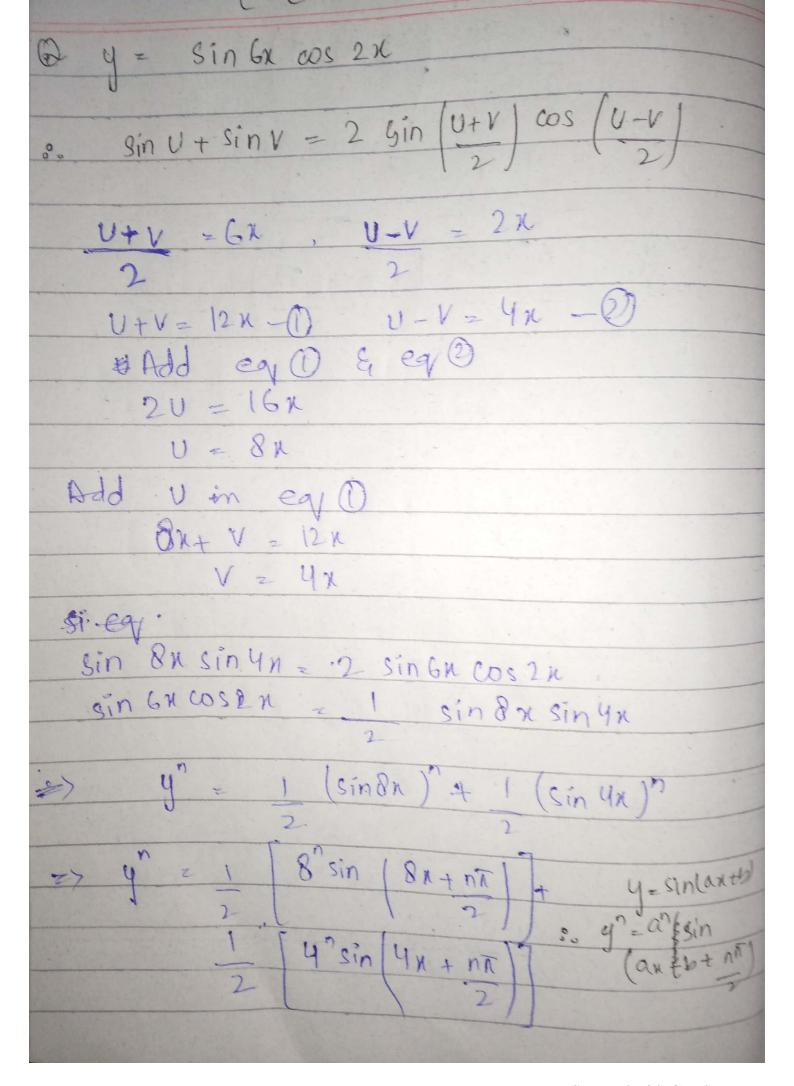


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the differential co-efficient z COS 2 K COS 7 + 21 cos





= 1 (8 sin (8x+n) + 4 sin (4x+n) that (1+x2) y" + xn' = 0

