ASSIGNMENT #112

	//33/d/v/	JEINI IT LL
-1		
	-a QUESTION	1 #02 80
(a)	724"- 3x4"+ 59=0;	19 = 92005 ((nx) + 622 sin((lmx))
	$y_1 = x^2 \cos(\ln x)$	GADO.
	y" = 3 y' + 5 y 20.	(b) (1-2x-x3)y"+2(1+x)y'-2y=0
	프랑테이트 아이를 하다면 하게 잘 하는데 그 때 그 때	y, = x+1
	$y_2 = n^2 \cos(\ln x) \int_{-\infty}^{\infty} e^{-\int_{-\infty}^{\infty} dx} dx$	
	Jarcos (ina)	y'' + 2(1+x)y' - 2y = 0 $(1-2x-x^2)(1-2x-x^2)$
		$(1-2\pi-\pi^2)$ $(1-2\pi-\pi^2)$
	= x2cos(lnx) (& hx3 dx	
	17 (03 (lnx)	94 + 2(1+x) y' - 2y =0
		$y'' + 2(1+\pi) y' - 2y = 0$ $(1 - (2\pi + \pi^2) (1 - 2\pi - \pi^2)$
	+ 12 cos((mi)) you do	
	7 72 cos(linx) f 75 dn	94 + 2(1+x) 91 - 2y =0 1-[2x+x2+1-1] (1-2x-x2)
		1-[22+2+1-1] (1-22-2)
	= x2 cos(lnx) Sec2(lnx)-1 dr	
	N	9"+ 2(1+x) y1 - 2y =0 2-(1+x)2 (1-2x-x2)
	z n 2 cos (lnx) - tand (lnx)	2-(1+x)2 (1-2x-x2)
		C 200
	4 = 74 Sin (link)	922 (xtl) (e) 2 (1+x)2 (xtl)2
	1/2) (x+1)2

2	22K-4187
1.5	
lac	
1/2 2 /2	+1) [& fr (2-(x+1)2] (2+1)2]
	(21+1)2
2(21 t	$(2-(3+1)^2)$ $(2+1)^2$
2($\frac{\chi(t)}{(n+t)^2} \left(\frac{2}{n+t} - 1 \right) d\chi$
Married	
	$(n+1)$ $\begin{bmatrix} -3 & -n \end{bmatrix}$ $\begin{bmatrix} (n+1) \end{bmatrix}$
2 -	(n41) [2+2(x+1)] (211)
92 z	$-2-\chi^2-\chi$ $2+\chi^2+\chi$
922	2+2+1
1/42 0	(x+1)+C2(2+x2+x)/
	4 Ans
	The second secon
1	

2215-4187 7- 9" - 34"+34'-4= 7-401 ye= C187+C1XE7+C3x2ex YPZ An+B+ Ex3ex 8. 4 (4) - 4 = 4x + 2x ex yc = G + C2x + C3ex + Cye-x 4pz Ax3+Bx2+(Cx2+Dx)e-x 9. y"1-2y"+y'=2-24e"+40e57 gc = CI + Cyet + Cynet 4pz Ax+ Bx2ex + Cesx 10. y "1 - 64" = 3 - 3 cosx 4c2 C1+C2x+C3 E6x Ypz An2+BLOSX + CSinx 4. y"+ 2y'- 24y = 16 - (x+2)e4x gcz c, e-6x + C2 e4x Ypz A + (Bn2 + Cn) e4x

22K-418		
- OUESTION #	0280-	
6) y" + y = 2xe2x >0	eque)	
D2y + y = 0	e2x[4Ax+4B+4A]+	
(02+1)y=0	e2x [Ax+B] = 2xe2x	
m2+1 =0		
mz £ 2	em[5An+5B+4A]=2xex	
ge = GCOSN + CZSINX	SA = 2	
11-0 G +	A = 2/5/	
HOR Gps	5B+4A=0	
- Jenje vac	B=-8	
1p= (Ax+B)e2x	25	
$y_p' = 2e^{2\pi}(An+B) + Ae^{2\pi}$	$\frac{y_{p}^{2}}{5} = \frac{2}{3} \times \frac{2}{35} e^{2x}$	
Ae2x	0: (5 25)	
yp4 = 4e21(Ax+B) + 2Ae24	/y = C1 c05x + C2 sin x + 6x - 8 2x	
1 MIL	(3 83)	
z & 22[4Ax + 4B + 4A]		

22K-4107		
(b) y"-3y'= 8e3x + 4sinx 7	eg(02).	
0	e37 [QAX+6A]-BCOS7-Csiny	
D2y - 3by = 0	- 9Axe37 - 9Ae3x + 9BSinz	
$(D^2-3D)y=0$	$-9C\cos x = 8e^{3x} + 4\sin x$	
$m^2 - 3m = 0$	e3x[9An+6A-9An+3A]	
m(m-3)20	+ cosx [-B-30]	
$m \stackrel{?}{=} 0$ $m = 3$	+ Sinx [-C+3B] =	
	De 3x + 46inx	
Jc z G + C2E37		
	3A = 8	
Ator ypo	[A=0]	
7 9 (H) = 8 e 3H + 4 Sind		
Let,	- C+3B=4 → €	
ypz Ane3 & BCOSX + CSINX	-3€ +B = 0 -> 0	
yp' = 3Ane3x + Ae3x - Bsinx	(eg 3 by '3' & add	
+ CCOSN	with (2)	
	- C + 3B/= 4	
yp" = 9Ane3x + 3Ae3x + 3Ae3x		
-Bcos - Csinx	-10Cz 4	
= 63x[9Ax +6A]-BCOS>-Csin	x /C= -2/5/	

	22K-418	37
` i		
-/-	2) + 38 = 4	There yes
		7 g(x) 2 6x2+2-12e3x
_	15B = 20.	Let,
	B = 6	yp = An = +Bn + C + Dxe34.
		$y' = 2An + B + 2Dne^{3n} +$ $3Dx^2e^{3n}$
yp= &	7 163x + 6 cosx + 2 sinx	30x2e3n
	3	
	37	19" = 2A + 6DAE34 + 6DXE34
192 G-	$+ C_{2}e^{3x} + 8 ne^{3x} + 6 \cos x$	$+9D\lambda^2e^{3\lambda}$
14/1/	a cias O.	= 2A+ e3x[12D2+2D+9D2]
	3/5 Sina - Ans	an Ora
		20 - 32 (12 Az 20 19 A 27
(c) 44-	heal 19. (-2.2.2.1)	$2A + e^{3x} [12Dx + 2D + 9Dx^2]$
	by 1 + 9y = 6x2 + 2-120	-12Ax-6B-12Dze3x
Dzy	-60y+9y=0	9Bx + 9C + 9Dn2e3x
/	-60+9)y=0	$z 6x^2 + 2 - 12e^3x$
	-6m+9=6	
	$(n-3)^2 = 0$	83x (13/0x +2D+ 9/0x2 - 12/0x
	= 3,3	-100x2 + 90x27-12Ax
		+9Bx +9Ax2 + 2A-6B
40 =	C103x + C1xe3x	+9C = 6x2+2-12e3x

@ 22K-4182		
Comparing afficents	(d) y" + 12y" + 36y' = 0	
20 = -12	y(0)=0, y'(0)=1, y"(0)=-7	
2D = -12 (D = -6/	m3+ 12m2+ 36m=0	
9A'=6	m (m2+ 12m+36)=0	
[A = 33]	$m=0$ $m^2+12m+36=0$ $(m+6)^2=0$	
-120+90-0	m=-6,-6	
-12A + 9B = 0 -12(3/3) + 9B = 0	yc = C, + C2e + Gxe x	
$\overline{B} = \frac{8}{9}$	0= (1+C2 = C1=-C2	
	02 (1+6) => (12-62	
2A-6B+9C=2	4 Cze-6x - 6Czze-a	
2(3/3) - 6(8/4) + 98 = 2	+ C30-6x	
TC= 2/3/	1=-60+C3 >0	
	9" = 36c, + 36c3xe-6" - 6c3e-6"	
y= qe3x+Qxe3x+2x2+Bx	-6636 -6636	
$+2+6n^2e^{3n}$	-7 = 36 C2 - 12 C3 -10	
CAPMS.		

22-K416	17	9
Q ag O by '6' & add with		
90		
6 = - 36¢2 +6C3		
-7 z 36/cz - 12 cz		1
-1 = -6 c3		
[C3 = 46]		
1=-6c2+16		
TC2 = -5		
36/		
1C1 = 5		
36		
to the first of the rest tool.		
19c = 5 - 5 e - 6x + 1 ne 1		
La Ana:		
	a delicate and the second	A SEC

(10	0 22K-4107		
	- of Marie		-
1	Question	#0480	
	$\frac{d^2x}{dt^2} + \omega^2 = F \sin(t + \pi/6) = 0$		
	2'(0)=0	eg(00)	
	D22+ W220	coswt[-Aw2t + 2BW+ At]	
	(D2+W2) 2 20	+ sinut[-Bw2t - ZAW + Bt]	
	m2 + W2 20	= F.sinut	
		=> - QAW=Fo	
-	$m = \pm \omega \tilde{z}$	FAZ -FO	
		$\frac{1}{2\omega}$	
1	Hc = Cicosut + Cismut	2820	
	H- 6. 6	[820]	
	THEOR YPS	5.	,
	7 ga) = Fosinut	7pz - Fofant cossit	
	xp = Acoqut + Bisinut	7 = G coswt + G sinut-Fo tos	લા
-	of z Acosut + Bisnut	7. 7(0) 20 Qw	
		0=c,-Fot => Ci=Fot Qu Qu	/
	of = - Aut sinut + Acosut +	ω ω	
	But cosut + Bsinut	7 = - CIW SINUT + GWESSUL +	
		w Smut - Fo cosut	
	7p" = -Aw2 t cosut - Awsinut	: x(to)20	KIR
	- Ausinut - Bu cosut	020+C, W-Fo	
	-Buztsinut + Bu cosult	2cu	
		TC22 Fo	
		2002	

$\pi = Fot \cos \omega t + Fo Ginut & Fo Fo count $ $y' = e^{\pi} a \cos \omega - 3e^{\pi} c \sin \pi $ $\pi = Fot \cos \omega t + Fo Ginut & Fo Fo count $ $y' = e^{\pi} a \cos \pi - 3e^{\pi} c \sin \pi $ $\pi = Fot \cos \omega t + Fo Ginut & Fo Fo Fo count $ $\pi = Fot \cos \omega t + Fo Ginut & Fo Fo Fo count $ $\pi = Go $		52K-4118	(I)
Laplas: $= \frac{1}{2} \frac{g'(0) = 0}{0}$ $0 = C_1 + 3C_2$ $g(0) = 0$, $g'(0) = 0$ $g(0) = 0$, $g'(0) = 0$ $g(0) = 0$, $g'(0) = 0$ $g(0) =$			
Laplas: $= \frac{1}{2} \frac{y'(0)=0}{0}$ $0 = C_1 + 3C_2$ $(0) = 0, y'(0) = 0$ $y'(0)=0, y'(0)=0$ $y'(0)=0, y'(0)=0$ $y'(0)=0, y'(0)=0$ $y'(0)=0, y'(0)=0$ $y'(0)=0, y'(0)=0$ As the function is continuous $0^2y - 20y + 10y = 0$ $0 $	F	The Court For Hosen	+ 4'= e'0 cosx - 3e'c, sinx 1
Laplas: $= \frac{1}{2} \frac{y'(0)=0}{0}$ $0 = C_1 + 3C_2$ $(0) = 0, y'(0) = 0$ $y'(0)=0, y'(0)=0$ $y'(0)=0, y'(0)=0$ $y'(0)=0, y'(0)=0$ $y'(0)=0, y'(0)=0$ $y'(0)=0, y'(0)=0$ As the function is continuous $0^2y - 20y + 10y = 0$ $0 $	1/2	aw aw 1	exc251031 +3802 cos3x
C $y'' - 2y' + 10y = g(x)$ $g(0) = 0$, $g'(0) = 0$ $g'(0) $g'(0) $	14	Las Ans.	~ y'(6)20
$g(x) = \begin{cases} 30 & 0 \le 180 \end{cases}$ $g(x) = \begin{cases} 0 & x > 7 \end{cases}$ $As the function is continuous$ $D^{2}y - 2Dy + 10y = 0 \qquad lim \left(-2e^{2}\cos 3x + \frac{2}{18}e^{3}\sin 3x + \frac{2}{18}e^{3}\cos 3x $			026,4362
$g(x) = \begin{cases} 30 & 0 \leq 1881 \end{cases}$ $g(x) = \begin{cases} 0 & x > 71 \end{cases}$ $As the function is continuous$ $D^{2}y - 2Dy + 10y = 0 \qquad lim \left(-2e^{2}\cos 3x + \frac{2}{13}e^{2}\sin 3x + \frac{2}{13}e^{2}\sin 3x + \frac{2}{13}e^{2}\sin 3x + \frac{2}{13}e^{2}\cos 3x + \frac{2}{13}e^{2}\sin 3x + \frac{2}{13}e^{2}\cos 3$	(a) y	"-ay'+10y=g(x)	1c2 2/31
$g(x) = \begin{cases} 30 & 0 \le 180 \end{cases}$ $g(x) = \begin{cases} 0 & x > 7 \end{cases}$ $As the function is continuous$ $D^{2}y - 2Dy + 10y = 0 \qquad lim \left(-2e^{2}\cos 3x + \frac{2}{18}e^{3}\sin 3x + \frac{2}{18}e^{3}\cos 3x $		9(0)=0, 9(0)=0	20 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
$D^{2}y - 2Dy + 10y = 0$ $\lim_{N \to N^{-}} \left(-2e^{2}\cos 3x + \frac{2}{3}e^{2}\sin 3x + 2\right)$ $m^{2} - 2m + 10 = 0$ $\lim_{N \to N^{+}} \left(e^{2}\cos 3x + e^{2}\cos 3x + e^{2}\cos$		9 20 05 751	92 -de COSS X + 13 C prisonta
$D^{2}y - 2Dy + 10y = 0 \qquad \lim_{N \to N^{-}} (-2e^{2}\cos 3x + 2ge^{2}\sin 3x + 2g)$ $m^{2} - 2m + 10 = 0 \qquad 2 \lim_{N \to N^{+}} (e^{2}\cos 3x + e^{2}\cos 3x +$		900) = 10 /1	As the function is continuous
$y_c = e^{\gamma_c}$, $\cos 3x + e^{\gamma_c}$, $\sin 3x$ Applying limit $2e^{\eta} + 2 = -e^{\eta_c}$ $3e^{\eta_c} + 2 = -e$		D2y - 2Dy + 10y 2 0	lim (-20037+ 2/30 sin3x+2)
$y_c = e^{\gamma_c}$, $\cos 3x + e^{\gamma_c}$, $\sin 3x$ Applying limit $2e^{\eta} + 2 = -e^{\eta_c}$ $3e^{\eta_c} + 2 = -e$		m2 - am + 10 20	2 lim (et C3 c0 5 31 + 8 c4 50 M3
$Ae^{n} + \lambda = -e^{n} C_{3}$ $A'HEN g(x) = 20 O \le x \le \pi C_{3} = -2e^{-n}(e^{n} + 1) $ $y_{p} = A , y_{p}' = 0 , y_{p}'' = 0$ $O - 2(0) \neq 10A = 20 Now applying Continuity for y'$			
MHEN $g(x) \ge 20$ $0 \le x \le \pi$ $\left \frac{c_3 = -2e^{-n}(e^2 + 1)}{2e^2 + 1} \right $ $y_p \ge A$, $y_p' = 0$, $y_p'' = 0$ $0 - 2(0) \ne 10A = 20$ Now applying Continuity for y'		yez etc, cossi + ec, sinsx	
yρ=A, yρ'=0, yρ"=0 0 - 2(0) = 10A= 20 Now applying Continuity for y'		WHEN Glade DEXETT	
0 - 200) + 10A = 20 Now applying Continuity for 9			
$\lim_{n \to \infty} \left(-\frac{\partial e^{n} \cos 3n}{\partial x^{n}} + \frac{\partial e^{n} \sin n}{\partial x^{n}} + \frac{\partial e^{n} \cos n}{\partial x^{n}} + \frac$		0 - 200) = 10A= 20	Now applying Continuity for y
you all the second of the seco			lim (-200332 + 60 sind +
y = exc, cos3x + ecz sin3x +2 lim (exc cosx - 3e cz sinx		4 = ex 6, cos3x + pc sin3x + i	138 SINSX + 20 COSO 27 1 Lim (1990, COSX - 38 7/23 SINX
y 60320 + ex cy sin3x + 3ex cy cos3x)		7 96520	+ ex cy sin3x + 3ex cy cos3x)
02/42		02/42	
C1 = -2 Applijing limits		101=-21	Applying limes
- ap e			-de - dg = -3

0	
1 of c3 = -3 of c4	- 2Csinx - Dzfinz + aDcosz
1cy = - 20 " (en +1) //	-Cxfosx + Ax+B+ Cxfosx
3.	+ Dysind =
1.	4x + 10 Sinx
9(W= Sel-20057x+ 3 sin3x)+2 05x58	
((1+en)en (-2cos3x+2/3sin3x) x77	sinx[-ac]+ cosx [aD]
4 Ans.	+ Ax+B= 4x + 10 sinx
(a) y"+y+4x+10sinx, y(n)=0, y'(n)=0	[A=4]
$D^2y + 9 = 0$	[B=0]
$m^2 \neq 1 = 0$	-2C=10
$m = \pm 1$	/c=-5/
9c = C, cos x + Casinx	2020 a/D=0/
	y= C, cosx+ Gsiny + 4x-52005x
For yps-	y(17)20
7 9(01) = 421 + 185ins1	0=-C1+411+517
Let,	10, = 911
yp= (An+B)+ CROSX+DASinx	y'z - CISINX + C2 COSX + 4
yp'= A + Ccosx - Cxsinx +	-5cosx + 5xsinx
Dsinx + Dx cosx	g'(n)=2
you = - Csinx - Cx cosx - Csin	1x . x = -C2 + 4+5
+ DCOSX + DCOSX - DX SI	1x 1c2 = +1
	4 = 971 cos x + 7 sinx +
	1 4x-5xcosx
	Las Ans.

2214-4187		3
	y"+4y=g(x) ; =0	(-A+4B)COSX + (-4A-B)Sinx
	9(0)=1, 9'(0)=2	2 Sind
		3A=0
	g(x)= fsinx OCX EN/2	[A=0]
	g(x)= fsinx OCX EN/2.	3821
		[B=1/3]
	m2+4020	
	$m^2 = -4$	9 z C. COSZOI + C2 Sin2x + 1 sinx
	$m = \pm 22$	3
		96)=1
	ge z c, cosa + cosnax	(Iz ci)
(15)		y 1 = -2 C, SARDA + 2C2 COS DX
V 11	The gas-	+ 1 C68x
	gare	3
	WHEN g(x)= Sinx OSXSZ	7 9'(0)=2
	Let,	2 2 2 C2 + 1
	yp= Acosx+ Bsinx	
	4/2 - Asina + BCOSA	[C2 = 5/6]
	yp" = - Acosn + Bsinn	
		y = cosax + 5 sinax + 1 sinx
	eques una vacio	
	- Acosx - Bsinx + 4Bsin	
	= Sinx	
	3Acosx +3Bsinx = sinx	
1		

As the function is continious, lim (cos2x+5 sin2x+ 1 sinx) = lim (c3cos2x+ c4 sin2x) Applying limits I sil ency [03=1] Now for g', lim (-25indx +5 cos2x + (cos x) = lim (-2Czsindx + 2Cycos2x) -5 = -2C4 (c4 = 5/6)