<u></u>
1.) Tentukan soluci masalah nilai awal untuk persamaan klein - Gordon utt (x,t) - p²uxx
$(x,y) + c^2 u_t = 0$, dengan kondisi awal $u(x,0) = f(x)$ dan $u_t(x,0) = g(x)$
Jawab: Dongan menggungton 11(x,0) = ((x)) don 711(x,0) = 0(x) +=0 combat
de to (2,t) + 2 or (+ 2 or (5 x) + 1 or (5 x
. 2018년 - 1917년 - 1918년
$U(\lambda_i t) = \int_{0}^{\infty} e^{i\lambda x} u(x_i t) dx$
$\sqrt{2\pi} \int_{-\infty}^{\infty} e^{-it} \sqrt{(x/t)} dx$
a) Persamaan transformasi fourier
Appropriate the second
$\frac{\partial u(\lambda_1 t)}{\partial u(\lambda_1 t)} + (y^2 \lambda^2 + Q^2) u(\lambda_1 t) = 0, t 70$
Sehingga dengan mudah dapat mendetermine bahwa
$U(\lambda_1 + t) = f + (\lambda) \exp(i \sqrt{y^2 \lambda^2 + e^2 t}) + f - (\lambda) \exp(-i \sqrt{y^2 \lambda^2 + e^2 t})$
26
sehingga dx dengan Ø + (x+,2) dapat ditulis sebagai
dt or we are the second and a
$\frac{dx}{dt} = \omega(\lambda) = \pm \sqrt{y^2 \lambda^2 + e^2}$
At 7.15 - 7 - 10 - 7
b.) Statement & + (x,t, 2) didapat dari (2 2 (())) = (2) = (0,x) out
$\frac{\partial \omega}{\partial \lambda} = \frac{\partial \omega}{\partial \lambda} \left[\frac{\partial \omega}{\partial \lambda} (\lambda) + \frac{\partial \omega}{\partial \lambda} \right] = \omega'(\lambda) + -\infty$
Section 2) a serie of the series of the parameter (i)
Figure 2 of substitution with the
X = (O(X)) MON DEC CONTROL SOUND (OX))) (O
$= 0 + y - \dot{x} = (\dot{x} \cdot \dot{x}) \dot{y} $
Hal itu menunjukkan bahwa, x = w'(n) = y2 2
1 \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
Milai dari 2 ditulis (x= Coox of y2) = (x)27=1/2 and Constitution
$w'(x) = y^2 x$ merupakan grup velocity
Vyz nz ez
$y^1 + \frac{1}{2} \times \frac{1}{2} = 0$
(e) 9t-x=0 /
(1) (3) -34
2 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -
$\frac{y^2 + 2 - x^2 \times 0}{y^2 + 2 - x^2 \times 0}$
9-t -×Z 0
선물수를 보면 보면 보다는 사람들은 사람들이 되었다. 그는 그는 그는 그들은 그는 그들은 그는 사람들이 되었다. 그는 그들은 그는 그는 그는 그를 가는 것이 되었다. 그는 사람들이 모든 사람들이 되었다. 전략을 되었다. 그는 그는 그를 가는 것이 되었다. 그를 가는 것이 되었다면 되었다. 그를 가는 것이 되었다면 되었다면 되었다. 그를 가는 것이 되었다면 되었다면 되었다면 되었다면 되었다면 되었다면 되었다면 되었다면

2) Diberikan persamoan difusi barikut Ut(x,t) + u²(x,t) Ux(x,t) = 0 dengan kondisi aw
2) Viberilan persamoan aifuei varisut ut Criti
u(x10) = X
a) Solusi nilai awal dan mengecek keabsahannya: -> Melalui Kurva = karakterustik, dari zy (xt) +z²(xt) zx(xt) =0 dapat ditulij
-> Melalui Kurva = karakterictik, aari ut (xx) i u c.i.
ut + 12 dx= 0 atou ou + a 10 = 0
an autority control to the first of the firs
$\frac{dt}{dc} = 1, \frac{dx}{dc} = v^2, \frac{du}{ds} = 0$
duntegralkan, dt = 1 => fdt = fds, => +=5
ds: 0.00 m
$dx = u^2 \iff \int dx = \int u^2 ds \iff x = u^2 s$
Acres in the contract of the c
du = 0 € 5 du = 50.ds € 7=0
ds
Jadi xi= u2t dan u1=0
→ Ingot banua xo=w → x = xo+x1
= w+u²t
$w = x - u^{1}t$
$v_0(x,0) = f(x) = f(x(w)) = f(w) = w$, maka $u = v_0 + v_1$
= f(m)+0
= x-u ² t 36 1 6
Sehingga u(xit) =x-uzt diaggap sebagai solusi persamaan (1)
-> Perlu validasi solusi u(x,t) = x-u²t
(i) u(x,t) harus memenuni kondisi awal untuk u(x,0) =x
$y(x,t) = x - u^2t$
$u(x_{10}) = x - u^{2}(0) $
u(x,0) = x
(ii) u(x+) harus kembali kebentuk asal persamoan (1) zword & Fresh salih
$u(xt) = f(x-\mathbf{n}^{2}t)$
$\frac{\partial u(x+)}{\partial x} = -u^2 \cdot f'(x-u^2t)$ with the property $f''(x)$ with
∂t t=0
$=-u^2-\xi'(x)$
$=-u^{2} \partial u$
3× ×
Substitusi, du + u² du = du 4 u' du
34 34 H=0 34 34 H=0 34 34
3× 3× 0

b.) Buatlah analisi	c White man-	cool - const		2. Y n. 24. 1. 24.
more and an arrangement of the potton	To dake prian	serta gomb	<u></u>	
purposed of 1988 (permitter through the distribution of the principle of the purpose of the purp	$\frac{3x}{\sqrt{3}} = \frac{3x}{\sqrt{3}}$	dimana, 1	x = f(m) = m	경기 없는 사람들은 사람들이 얼마나 그렇게 살아왔다면 되었다.
AND WARE CONTRACTOR AND THE SAME AND ADDRESS AND ADDRE	Jx Jx		$\frac{\partial u}{\partial x} = 1$	
PART CONTRACTOR CONTRA			with the second	
	and the second control of the second control	0 - <u>v</u>	x= w= w======	rponso py tr
adag kirikan a kon karin da sa ya karin kari	() () () () () () () () () ()		3x = 1	
Sahinaga Zi	du l		: \m\ = \\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	
- Ax	= 700 = 1 =	1		///
general control of the control of th	Am .	70 1 e- 2 1	25 F Y	, D
Gambar untur	t=0 -> 1(x,0	1) = 4		
and the second s	t=1 -> 71(x,	Company of the compan	<u> </u>	un.
raine d'impart point recluir. Arbentaine de paine inclueme à par le montre par de mais de la faire de	t= 2 -7 70(x.	$\frac{1}{2} = \frac{1}{2} = \frac{1}{2}$	so per star gift a	
	t=3 - 10(x.3	-/- > - 2u	Haraman State of the State of t	XI CHI C
	t=4 => 11(x,	$4) = \times -4u^{2}$		
	, , , , , ,	7,7		$\frac{x = \mathcal{T}}{2\pi i}$
E 44			(47-2,20)	
	10 -	- Marie - Mari	*	201922 G / NF
	(=1) = = 1	7.7 /17.		(%
<u></u>			***	44
	1 = 5 = 5 / 1		- 1 - 1 t	L
39)
j - (- = -10	0	· ·	10 10 1 1	5
			= 16 2	r art se j
972) 2.8 - (37 - V.D	79 70 V 60 (14-2) 1-5-	FY-X) P = W)
	992Y	1	o h	
Diberikan utt (xt) - yz	Uxx (x1+) =0 d	.imana kondisi	awalnya berben	tuk V(x10)=f(x)=cos
dan Ut (x10) = sinx			20 - 7 05	
Jawab:		0.3		2.5
a.) Solusi masalah nilo	ai awal Red	ursi PDP orde	2 ke PDP orde 1	Y)=V 1000
$\left(\frac{3+}{3+}+\frac{3}{3}+\frac{3}{3}\right)$	$\left(\frac{\lambda}{\delta t} - \lambda \frac{\delta}{\delta x}\right)$	V=0 =		$\begin{pmatrix} 2 \\ \times^{\ell} \end{pmatrix} V = 0$
() v ·	-1) (*)	<u> </u>	2. C.	
1 H - 1 Px				See William
[&v + x &		*)		- Language and
	8×1 3/1 4×2 20		48-4) 200 (1)	T=(+:4)
• Initial Value	<u> </u>		<u> </u>	
	f(x) = 602 x	Ux (x,0)) = - Sinx, ketika	K=T, dV (T,0)=-8

₩ V+(x10) = g(x) = sinx, x0 = t dant=0
Sehingga, $W(T,0) = g(T) = \sin T$
dt :/ ! = :
· kurva - kurva karakterstik
Persamaan (**) tv + y tv = 0
bt bx
$\frac{dt}{ds} = 1 \Rightarrow \int \frac{dt}{ds} = \int 1 \Rightarrow \int \frac{dt}{ds} = \int 1 \cdot ds \Rightarrow t = S$
de de
$\frac{dx}{ds} = y \rightarrow \int \frac{dx}{ds} = \int y \rightarrow \int dx = \int y \cdot ds \rightarrow x = ds$
ds J ds J J J
$\frac{dv}{ds} = 0 \rightarrow \int \frac{dv}{ds} = \int 0 \rightarrow \int \frac{dv}{ds} = \int 0 \cdot ds \rightarrow V = 0$
A PORALLY A MANAGEMENT AND A STATE OF THE ST
t=S,×= tc → ×1 = t +
x = X0 + X1 = T + Yt 11 - x - (8: 11) x = 8 = 1
V ₁ = 0
$\Lambda = \cos(x - \lambda f)$
Persamaan (*)
$\frac{bv - 8bv = g(x - 8t) - 8 \cdot f'(x - 8t)}{bv - 8bv = g(x - 8t) - 8 \cdot f'(x - 8t)}$
bt dx
$\frac{dt}{ds} = \int \frac{dt}{ds} = \int \frac{1}{1} \Rightarrow \int \frac{dt}{ds} = \int \frac{dt}{ds} = \int \frac{dt}{ds} = \int \frac{dt}{ds} = $
$\frac{dx}{ds} = -\gamma \int \frac{dx}{ds} = \int -\gamma - \frac{dx}{ds} = \int -\gamma - \frac{ds}{ds} \rightarrow x = -\gamma - \frac{1}{2}$
ds ds
dv = g(x-yt)-y.f'(x-yt) => v=(x-yt)-y.f'(x-yt)d
ds
20) = (x17 = (cxy y xutperina vanisaca ischov samus o = (x1x + f (x + f +) atc. novinutti (3)
$d\lambda = 2.7 - 7 ds = d\lambda$, sehingga $4.002 = (0.00) dt$
ds 2.8 : 1020).
$V = \left(\frac{-3(\lambda) + \beta - f'(\lambda)}{(\lambda)} + f(x + \beta + \beta) + \dots \right)$
1 0 - 0 - 0 - 12) 36 0 - 0 - 0 (/ 2 x - 2) / 8 x (2)) 3 (2)
=-1 [G(x-8+)-G(x+8+)]+-[[f(x-8+)-f(x+8+)]+f(x+8+)]
2.8
Solusinya,
V(x,t)= (9+1 cos (x-8+)] + (8-1 cos (x+8+))
outal fatials.
(Control of the distance of the control of the cont
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b.) Cek keab	sahan solvei
Martin Act was conferenced and the second of	uhi Nitial value
N(X'O)	
The state of the s	1
	$= 2.7 (7) \cos(x) = \cos(x) = f(x) \qquad (securi)$
	2.8
ðv	= [x+1 (-x)(-sin (x-x0))]+[x-1 (x)(-sin(x+x0))]
8+1	$= \frac{[7+1](-8)(-\sin(x-80))}{1+0} + \frac{[8-1](8)(-\sin(x+80))}{2.8}$
	$= \frac{2}{2\delta} (\delta) \sin(x) = \sin(x) = g(x) \qquad (\delta \cos(x))$
2.) Kembal	i kebentuk dasar
₹v	$= \left[\frac{3+1}{2}(-1)(-\sin(x-10))\right] + \left[\frac{3-1}{2}(1)(-\sin(x+10))\right]$
ðt 1t=	
<u> </u>	$= 2 (\gamma) \sin(\gamma) = 9(x)$
12.1.	2.8
# V =	(cs(x) = g'(x)) (sesuai)
0+ H=	.0
801	$= -cin(x) - c'(x) \qquad \qquad$
dx +=	
ux 10°	0 % K-1
e) Grafik so	luei
0) 0.0 (1.2 0.0	U(x,t)=[8+1 cos (x-xt)]+[8-1 cos (x+xt)]
	$V(x_1t) = \begin{bmatrix} t+1 & \cos(x-yt) \end{bmatrix} + \begin{bmatrix} t-1 & \cos(x+yt) \end{bmatrix}$
untuk y:	= 2
-	
,	
	있는 것이 있는 것이 있는 것이 있다. 그는 것이 없는 것이 없다. 그렇게 함께 생각하다.
ANGELICE CONTRACTOR	
(SiDII)	