20 Eular Equations: (invised)

$$P = P_{\infty} \ \rho = \rho_{\infty} \ u = M_{\infty}c_{\infty} \ v = 0.$$

$$\frac{\partial \rho}{\partial t} + \frac{\partial \rho u}{\partial x} + \frac{\partial \rho v}{\partial y} = 0$$

$$\frac{\partial \rho u}{\partial t} + \frac{\partial P + \rho u^{2}}{\partial x} + \frac{\partial \rho u}{\partial y} = 0$$

$$\frac{\partial \rho u}{\partial t} + \frac{\partial P + \rho u^{2}}{\partial x} + \frac{\partial P + \rho v^{2}}{\partial y} = 0$$

$$\frac{\partial E}{\partial t} + \frac{\partial (P + E)u}{\partial x} + \frac{\partial (P + E)v}{\partial y} = 0$$

$$\frac{\partial E}{\partial t} + \frac{\partial (P + E)u}{\partial x} + \frac{\partial (P + E)v}{\partial y} = 0$$
For gradients determine what flow evolves from equs.

$$P = \frac{\partial P}{\partial t} + \frac{\partial P}{\partial x} + \frac{\partial P}{\partial y} = 0$$

$$\frac{\partial E}{\partial t} + \frac{\partial (P + E)u}{\partial x} + \frac{\partial (P + E)v}{\partial y} = 0$$

$$\frac{\partial E}{\partial t} + \frac{\partial (P + E)u}{\partial x} + \frac{\partial (P + E)v}{\partial y} = 0$$
For gradients determine what flow evolves from equs.

$$P = \frac{P}{\partial t} + \frac{P$$

•	Jto	rt	with	g	ws	sed	કા	r	at		t =	0	(nor	mall	free	stree	in	val	er.	s).		
•	Enfo	re	bo	mo	lar	y (cond	iti	DN	5	(e.	g t	onge	entral	flou	,)						
	Eval	nat		ern	N	'n	Sp	ati	<i>i</i> l	gra	die	nts	at	even	poir	t :	ER	ROR	2=	<u>dev</u> dx	+ -	<u>bpv</u> dy
	lf																			V		V
·	Eval (p	uate in	e up	dat	e	to	Corv	7en	ved	ya	riab	'es							<u>dp</u> dt	- =	0	for
	۲r					•			- L	∆t x	E E K	ROR								20	zad:	5
<i>.</i>	t =											aga	in.									
												v										
->	This	, <u> </u>	ochem	e	is	opf	olied	. t	o e	ach	of	he	4	egns	at	evers	pou	it i	'n	nesl	۲ .	
								•				0										
N	umer	Ň	L	So	ut	ion	, 1	61	æð	nre	必	for	N	lowier	- Sta	okes		ike	ટ	tq	nati	ion :
												V										
				:				lır				-		raboli						•		
-	Nov. Whe	Ste	ikes .Xam	ini	g vg	, 2 r mu	on. neri	ċa	éar 1 m		cory	sled,	ро		ic Pl)E`s	ام	us e	egn 1	of	S	tate
-	Now.	Ste	ikes .Xam	ini	e Vg Vir) MU at	on. neri	ca IS	ior I m	, .eth	cory ods	oled,	ро. . V.	raboli se S	ic Pl)E`s	ام	us e	egn 1	of	S	tate
-	Nov. Whe	Ste	ikes .Xam	ini	e Vg Vir	pm mu as	on. neri , N	ica IS 10	ios I m No	, .eth n- (cory ods	ir E	pa U: Burg	raboli se S ers'	ic Pl	DE`s	pli yns	us e C	egn hal	• • • •	S(exhi	tate bit
-	Nov. Whe	Ste	ikes .Xam	ini	e Vg Vir	pm mu as	on. neri , N	ica IS 10	ios I m No	, .eth n- (cory ods	oled,	pa U: Burg	raboli se S ers'	ic Pl	DE`s	pli yns	us e C	egn hal	of	S(exhi	tate bit
-	Nou. Uhe	Sta n (ikes Xam beha		C V V V V V V V	2 m mu a= e.g	0n- nerz , N g	ca ID t	έαι ι m νσ <u>δ 2</u>	.eth n - 0 <u>- 0</u> 2	cory ods line	oled, ve ar E = (po v. Burg X C O al	raboli oe S ers' o ² u loc ² derivat	ic Pl	PE's	pli yns U		egn hal an		s(exhi calc	tate bit
· · ·	Nau. Uhe Sam	Ste n (e	es	ini vio L	c vg ir > tis	ν ν ν ν ν ν ν ν ν ν ν ν ν ν ν ν ν ν ν	on- neri N g feo	ca IS tu	ion In No <u>d</u> 2 0	eth n - 1 5 U ² 3	cory ods line	ir E	po v Burg X O al and	raboli oe S ers' o ² U loc ² derivat a	c Pl uniple ie digfi	PE's Per Per Per Per Per Per Per Per Per Per	pl ps U		egn hal an	of c a of s	sl exhid	tate bit
· · ·	Nau. Uhe Sam	Sta n (2 ne	es	ini vio L	e vg vir > tis	e.e	on- nerz N g feo	ca IS tu	ion In No <u>d</u> 2 0	eth n - 1 5 U ² 3	cory ods line	ir E	po v Burg X O al and	raboli oe S ers' o ² u loc ² derivat	c Pl uniple ie digfi	PE's Per Per Per Per Per Per Per Per Per Per	pl ps U		egn hal an	of c a of s	sl exhid	tate bit
	Nav. Whe Sam	Sta n (e ne pore	es	inii vio L:	y iir > tis >	e.e are du du du	on- nerz N g feo lstic ns.	ica IS 10 tur	ios L m No <u>D 2</u> O 2 Sh	.eth n - 0 <u>~</u> 2 	cory odc line te	oled, ve ir E = (npot	po v Burg x C o al and for	raboli oe S ers' o ² loc ² deriat a some	c Pl uniple ie digfi	PE's Per Per Per Per Per Per Per Per Per Per	pl ps U		egn hal an	of c a of s	sl exhid	tate bit
	Nav. Uhe Sam Sar	Sta n (e ne pore	es	inii vio L:	y iir > tis >	e.e are du du du	on- nerz N g feo lstic ns.	ica ID t tur	ias L m No <u>D 2</u> D 2 D 2 S n		cory ods line te ovo	pled, ue ir E = (mpor	po v Burg x C o al and for c f	raboli oe S ers' o ² U loc ² derivat & some	c Pl uniple ie digfi	PE's Per Per Per Per Per Per Per Per Per Per	pl ps U		egn hal an	of c a of s	sl exhid	tate bit
>	Nav. Uhe Sam Sar Der Com	Sta n (e ne pore	es vit	sen	G is s tis b cal Bur	e.e are du du du du du du	on- nerz N g j feo lytic rs.	is 10 tur sl	ian L m <u>No</u> <u>D 2</u> <u>D</u> <u>D</u> <u>D</u> <u>D</u> <u>D</u> <u>D</u> <u>D</u> <u>D</u> <u>D</u> <u>D</u>		cory ods line te ovol	ir E ir E ir C npor valia	po v. Burg x. c al and for z c for z c	raboli oe S ers' o ² loc ² deriat a some	c Pl	Non- wie	pl yrs U Line ta		egn bal anu sp	otion	sl exhid cale	tate. bit

							Ĺ	~			00	ł	- ($\frac{\partial u}{\partial x}$	=	6				(L	nė	አ	۲)))	2	e	fuc	sti	ρΛ.)
											-																				
į	5	at		t=	-0	,	υ	(x	-,0)	=	f	(x)	, (Ler	r	v(;	x,t) =	-	f (X-	ct	(ر						
																		5	د	ave	2 (rt	۵	ŝ	ton	Ł	spe	e	d	С	
J	e	Ŵ	ilı	K	Le.	IJ	h	a	s	łe	ot	C	m		for	074	~	NM	nen	(A)	L	м	sthe	, dr			•				
														V				7 004				,,,,,									
•	G	ve	55	U	رعر	,0,)																								
•	E	nfe	re	•	BC	:3																									
•	L	et.	Sơ	ht	or	e	าง ๙	ne	•	(b/	Ne	• rv	vn	L)	00	v	Sn.	all	Δt	5	to	٨	ω.	sh	ι.	υ (ω,	, t	+ /	Δt)
•			oto																								-				
					•	-										,															
•	lf		<u>ou</u> Dt	5	mo	U	ωe	e	ho	e	Sł	ead	5	stat	e	sh.															
	1		vot	•	se	k		t =	- t	; +	- 4	t	ar	d	go	te	, 2	•													
(<	~~~ <i>~</i>	ľ.	م	500		منما	- (ctor	•		mb	امم		• •		tea	L	.c./.	t	0	۵.	٥°	000	Ani	1	r.m.	L	a . 6	,		
06	للن	atir	a .	shal	.k.	ny: se)、))	205		2100			r. <i>X</i>	U V	ven	0	000	twi	E.	J	U	uun	yr	~	Carc.	· /	مرو	•		
			7			-		-																							
)																												
			9																												
)																												