Camry Mullin 260926298
Problem 7
$\frac{dy}{dx} = \frac{y}{(4x^2)} \times (-20, 20)  y(-20) = 1  nstep = 200$
/ IL)? / / / L2
(1(1) = arctan (x) +c -> y= earth(x) +c = cearth(x)
1= earcton(-20) C -> C= 4.576
N1: 4f(x,y)
Mz=hf(x+ ½, y+ ½) (rhy nethod
M3: 4+(x + 2, 7+ 1/2)
hy = hf(x +h, y + ns)
y (x2h) = y(x) + (k1 + 242 1 243 + 44) 6
YI = Thy Step (An, x11,1)
729 = rhy_styp(Fm,x, y, 4/2) 7 rhy_322pd
725 = Ch _ Ship [ Kin, x 1 h/2, 7, 4 cm, WZ)
1/2 = 1/24 + 1/26
71=4-ten
72 = 7-Inc + emr4
4/2 = 4/2 for ten
742 -11 = 87-time (enry are carcelled), 4-time= 442-71
The 164 Step of Lates 11 Function evals por step.
Forcing the function evals RUY step Preforms Letter. It RKY-stept
is allowed now function evals it will preform better by
a factor of lo2

Problem 2	0 11														
Usanium-234 245 500 years alpha Thorium-236 7580 years alpha Radium-236 1600 years alpha Radium-226 1600 years alpha Polomium-218 160.8 minutes beta- Bismuth-214 19.9 minutes beta- Bismuth-214 19.9 minutes beta- Bismuth-210 50.15 years beta Polonium-210 138.376 days alpha Polonium-210 518.376 days alpha Polonium-210 138.376 days Alpha Polonium		0					١,								
Usanium-234 245 500 years alpha Thorium-236 7580 years alpha Radium-236 1600 years alpha Radium-226 1600 years alpha Polomium-218 160.8 minutes beta- Bismuth-214 19.9 minutes beta- Bismuth-214 19.9 minutes beta- Bismuth-210 50.15 years beta Polonium-210 138.376 days alpha Polonium-210 518.376 days alpha Polonium-210 138.376 days Alpha Polonium	<u> Moblem</u>	2								Half-Life	Time u	init		Emitter	
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Usanim-234 245 500 years alpha Thorism-230 75380 years alpha Radism-226 1600 years alpha Polomism-218 160.8 minutes beta- Bismuth-214 19.9 minutes beta- Bismuth-214 19.9 minutes beta- Polonism-210 22.3 years beta Radism-210 50.15 years beta Polonism-210 138.376 days alpha Polonism-210 138.376 days alpha Polonism-210 138.376 days alpha Polonism-210 50.15 years beta Polonism-210 50.15 years beta Polonism-210 50.15 years beta Polonism-210 50.15 years beta Polonism-210 138.376 days alpha Polonism-210 50.15 years beta Polonism-210 50.15 years beta Polonism-210 138.376 days alpha Polonism-210 50.15 years beta Polonism-210	(12.20	( ) ,	ſc.,					Thorium-234		24,10	days			beta -	
Usanim-234 245 500 years alpha Thorism-236 75380 years alpha Radism-226 1600 years alpha Plomb-218 26.8 minutes beta- Bismuth-214 169.9 minutes beta- Bismuth-214 164.3 microseconds alpha Plomb-210 22.3 years beta Radism-210 50.15 years beta Plomb-210 138.376 days alpha Plomb-206 Stable  USE in Legrate. Silve IVP( method: "Radism')  Ya leccury sinds $y \neq y$ with rate $y = y$ with rate	~ ~ ~ ~ ~ ~	000	uy					Protactinium-23	34	6,70	hours			beta -	
Radium-226 1600 years alpha Radon-222 3,5235 days alpha Radon-223 3,5235 days alpha Polonium-218 3,10 minutes alpha Polonium-214 26,8 minutes beta- Bismuth-214 19,9 minutes beta- Bismuth-214 164,3 minutes beta Bismuth-210 5,015 years beta Bismuth-210 138,376 days alpha Polonium-210 138,376 days alpha Polonium-210 138,376 days alpha Polonium-210 138,376 days alpha Polonium-210 $\frac{1}{1}$ $\frac{1}{$			(					Uranium-234		245 500	years			alpha	
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Polonium-218 3.10 minutes alpha  Plomb-214 26.8 minutes beta-  Bismuth-214 19.9 minutes beta-  Polonium-210 19.3 years beta  Polonium-210 5.015 years beta  Polonium-210 138.376 days alpha  Plomb-206 Stable  USE integrate. sulce IVP( method: "ladan")  Ya decungs into $76 \Rightarrow \text{with rate } 76$ Using the rate of the										1 600	years				
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Bismuth-210  Polonium-210  138.376  days  alpha  Plomb-206  Stable    USE  integrate. since IUP( method: "Radan")  Ya lectings into $\frac{1}{2}$ with rate $\frac{1}{2}$ (I diany, Min $\frac{1}{2}$ = ) (-1) th rate $\frac{1}{2}$												conds			-
MSe integrate. sulce IVP( method: "Radan")  Ya lecun; sindo y \( \frac{1}{2} \) with rate \( \frac{1}{2} \)  (1 dian; mile y \( \frac{1}{2} \) = \( \frac{1}{2} \) \( \frac{1}{2} \)  \[ \begin{align*} \text{Point-206} & \text{Stable} &											_				-
Plant-206 Stable  USE integrate site IVP( method: "Radan")  Ya hecongs into $y_{6} \neq with rate C_{9}$ (1 decay, mode $y_{6} = with rate C_{9}$ $\frac{dy_{6}}{dt} = -T_{6}y_{6}$															
Use integrate. sine IVP( method: "Radan")											uays			аірпа	-
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b) It can be seen that as U2St decays into Pb206 the ratio 04 PL206/UZSS trends toward intinity. When UZSS is about half decayed, the ratio is close to 7. for Th230 and U234 she ratio stard at 200 and this steality increase as UZJY decay, into Thesa Eventually it reacher a steely amont for both.

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$f \sim \frac{1}{49}$ $\frac{1}{49} = \frac{42}{47}$		.2		
y '(x) = 2a y"(4) = 2a	X		1646) + Y'(X-X0)	2
411(x)=0	ax2 + 20	x (x-yc) +	G (X-40)2	