

punto 14

14)a)

X	0	0,25	0,5	0,5	1	1,25	1,5	1,75	2
y=0	0	25	50	75	00	75	50	25	0
Y=0.2	0	25	50	75	75,76	75	50	25	0

14)b) Metodo explicito

0.00000	25.00000	50.00000	75.00000	100.00000	75.00000	50.00000	25.00000	0.00000
0.00000	25.00000	50.00000	75.00000	75.76000	75.00000	50.00000	25.00000	0.00000
0.00000	25.00000	50.00000	63.24845	75.02310	63.24845	50.00000	25.00000	0.00000
0.00000	25.00000	44.30285	62.53395	63.60640	62.53395	44.30285	25.00000	0.00000
0.00000	22.23802	43.78327	54.21543	62.56656	54.21543	43.78327	22.23802	0.00000
0.00000	21.90216	38.39565	53.20654	54.46931	53.20654	38.39565	21.90216	0.00000
0.00000	19.28004	37.57993	46.63841	53.24493	46.63841	37.57993	19.28004	0.00000
0.00000	18.80486	33.09969	45.44970	46.83925	45.44970	33.09969	18.80486	0.00000
0.00000	16.61840	32.15684	40.13607	45.49194	40.13607	32.15684	16.61840	0.00000
0.00000	16.09484	28.49213	38.86427	40.29889	38.86427	28.49213	16.09484	0.00000
0.00000	14.30227	27.51033	34.53136	38.90788	34.53136	27.51033	14.30227	0.00000
0.00000	13.77180	24.51086	33.24930	34.66441	33.24930	24.51086	13.77180	0.00000
0.00000	12.30153	23.54096	29.69895	33.29232	29.69895	23.54096	12.30153	0.00000
0.00000	11.78662	21.07747	28.45562	29.80819	28.45562	21.07747	11.78662	0.00000
0.00000	10.57667	20.15020	25.53442	28.49674	25.53442	20.15020	10.57667	0.00000
0.00000	10.09035	18.11922	24.36028	25.62447	24.36028	18.11922	10.09035	0.00000
0.00000	9.09095	17.25249	21.94750	24.39871	21.94750	17.25249	9.09095	0.00000
0.00000	8.64037	15.57191	20.85971	22.02201	20.85971	15.57191	8.64037	0.00000
0.00000	7.81193	14.77502	18.85967	20.89504	18.85967	14.77502	7.81193	0.00000
0.00000	7.40041	13.37955	17.86618	18.92155	17.86618	13.37955	7.40041	0.00000
0.00000	6.71138	12.65598	16.20270	17.89826	16.20270	12.65598	6.71138	0.00000
0.00000	6.33965	11.49349	15.30526	16.25425	15.30526	11.49349	6.33965	0.00000
0.00000	5.76477	10.84285	13.91738	15.33411	13.91738	10.84285	5.76477	0.00000
0.00000	5.43186	9.87153	13.11368	13.96045	13.11368	9.87153	5.43186	0.00000
0.00000	4.95085	9.29098	11.95240	13.13942	11.95240	9.29098	4.95085	0.00000
0.00000	4.65477	8.47714	11.23761	11.98849	11.23761	8.47714	4.65477	0.00000
0.00000	4.25122	7.96233	10.26336	11.26044	10.26336	7.96233	4.25122	0.00000
0.00000	3.98938	7.27872	9.63120	10.29367	9.63120	7.27872	3.98938	0.00000
0.00000	3.65000	6.82453	8.81189	9.65134	8.81189	6.82453	3.65000	0.00000
0.00000	3.41949	6.24899	8.25538	8.83741	8.25538	6.24899	3.41949	0.00000
0.00000	3.13346	5.84995	7.56485	8.27308	7.56485	5.84995	3.13346	0.00000
0.00000	2.93131	5.36438	7.07682	7.58638	7.07682	5.36438	2.93131	0.00000
0.00000	2.68976	5.01502	6.49366	7.09231	6.49366	5.01502	2.68976	0.00000
0.00000	2.51305	4.60458	6.06704	6.51186	6.06704	4.60458	2.51305	0.00000
0.00000	2.30870	4.29961	5.57369	6.08056	5.57369	4.29961	2.30870	0.00000
0.00000	2.15463	3.95209	5.20174	5.58910	5.20174	3.95209	2.15463	0.00000
0.00000	1.98147	3.68652	4.78370	5.21352	4.78370	3.68652	1.98147	0.00000
0.00000	1.84746	3.39183	4.46016	4.79677	4.46016	3.39183	1.84746	0.00000
0.00000	1.70052	3.16105	4.10542	4.47039	4.10542	3.16105	1.70052	0.00000
0.00000	1.58417	2.91082	3.82453	4.11651	3.82453	2.91082	1.58417	0.00000
0.00000	1.45932	2.71063	3.52311	3.83340	3.52311	2.71063	1.45932	0.00000
0.00000	1.35847	2.49789	3.27965	3.53255	3.27965	2.49789	1.35847	0.00000
0.00000	1.25227	2.32450	3.02326	3.28734	3.02326	2.32450	1.25227	0.00000
0.00000	1.16499	2.14344	2.81252	3.03128	2.81252	2.14344	1.16499	0.00000
0.00000	1.07456	1.99346	2.59421	2.81917	2.59421	1.99346	1.07456	0.00000
0.00000	0.99909	1.83922	2.41203	2.60105	2.41203	1.83922	0.99909	0.00000
0.00000	0.92203	1.70962	2.22597	2.41777	2.22597	1.70962	0.92203	0.00000
0.00000	0.85686	1.57812	2.06863	2.23180	2.06863	1.57812	0.85686	0.00000
0.00000	0.79112	1.46625	1.90993	2.07359	1.90993	1.46625	0.79112	0.00000

0.00000	0.73489	1.35405	1.77418	1.91491	1.77418	1.35405	0.73489	0.00000
0.00000	0.67878	1.25756	1.63872	1.77846	1.63872	1.25756	0.67878	0.00000

14)c) (metodo implicito)

0.00000	25.00000	50.00000	75.00000	100.00000	75.00000	50.00000	25.00000	0.00000
0.00000	24.76009	49.02532	71.28006	85.86167	71.28006	49.02532	24.76009	0.00000
0.00000	24.20037	47.24619	66.62220	76.39041	66.62220	47.24619	24.20037	0.00000
0.00000	23.35996	44.98639	61.95152	69.28240	61.95152	44.98639	23.35996	0.00000
0.00000	22.32098	42.49886	57.54570	63.50462	57.54570	42.49886	22.32098	0.00000
0.00000	21.16530	39.94676	53.46397	58.56178	53.46397	39.94676	21.16530	0.00000
0.00000	19.95826	37.42675	49.69720	54.19790	49.69720	37.42675	19.95826	0.00000
0.00000	18.74633	34.99282	46.21882	50.26994	46.21882	34.99282	18.74633	0.00000
0.00000	17.56002	32.67303	43.00100	46.69156	43.00100	32.67303	17.56002	0.00000
0.00000	16.41794	30.48012	40.01897	43.40676	40.01897	30.48012	16.41794	0.00000
0.00000	15.33049	28.41789	37.25150	40.37663	37.25150	28.41789	15.33049	0.00000
0.00000	14.30261	26.48500	34.68043	37.57249	34.68043	26.48500	14.30261	0.00000
0.00000	13.33578	24.67729	32.29001	34.97202	32.29001	24.67729	13.33578	0.00000
0.00000	12.42936	22.98905	30.06639	32.55706	30.06639	22.98905	12.42936	0.00000
0.00000	11.58144	21.41388	27.99718	30.31231	27.99718	21.41388	11.58144	0.00000
0.00000	10.78942	19.94511	26.07118	28.22448	26.07118	19.94511	10.78942	0.00000
0.00000	10.05033	18.57614	24.27818	26.28178	24.27818	18.57614	10.05033	0.00000
0.00000	9.36111	17.30055	22.60881	24.47364	22.60881	17.30055	9.36111	0.00000
0.00000	8.71867	16.11218	21.05442	22.79042	21.05442	16.11218	8.71867	0.00000
0.00000	8.12002	15.00520	19.60702	21.22329	19.60702	15.00520	8.12002	0.00000
0.00000	7.56229	13.97414	18.25921	19.76412	18.25921	13.97414	7.56229	0.00000
0.00000	7.04275	13.01383	17.00409	18.40540	17.00409	13.01383	7.04275	0.00000
0.00000	6.55882	12.11946	15.83528	17.14017	15.83528	12.11946	6.55882	0.00000
0.00000	6.10811	11.28652	14.74682	15.96197	14.74682	11.28652	6.10811	0.00000
0.00000	5.68834	10.51081	13.73320	14.86478	13.73320	10.51081	5.68834	0.00000
0.00000	5.29739	9.78839	12.78925	13.84304	12.78925	9.78839	5.29739	0.00000
0.00000	4.93331	9.11562	11.91020	12.89153	11.91020	9.11562	4.93331	0.00000
0.00000	4.59424	8.48908	11.09156	12.00544	11.09156	8.48908	4.59424	0.00000
0.00000	4.27847	7.90560	10.32920	11.18025	10.32920	7.90560	4.27847	0.00000
0.00000	3.98440	7.36223	9.61923	10.41179	9.61923	7.36223	3.98440	0.00000
0.00000	3.71054	6.85620	8.95807	9.69615	8.95807	6.85620	3.71054	0.00000
0.00000	3.45551	6.38495	8.34235	9.02970	8.34235	6.38495	3.45551	0.00000
0.00000	3.21800	5.94609	7.76895	8.40905	7.76895	5.94609	3.21800	0.00000
0.00000	2.99682	5.53740	7.23496	7.83107	7.23496	5.53740	2.99682	0.00000
0.00000	2.79084	5.15679	6.73768	7.29281	6.73768	5.15679	2.79084	0.00000
0.00000	2.59901	4.80235	6.27457	6.79155	6.27457	4.80235	2.59901	0.00000
0.00000	2.42037	4.47227	5.84330	6.32474	5.84330	4.47227	2.42037	0.00000
0.00000	2.25401	4.16487	5.44167	5.89002	5.44167	4.16487	2.25401	0.00000
0.00000	2.09909	3.87861	5.06765	5.48518	5.06765	3.87861	2.09909	0.00000
0.00000	1.95481	3.61202	4.71933	5.10817	4.71933	3.61202	1.95481	0.00000
0.00000	1.82045	3.36375	4.39495	4.75706	4.39495	3.36375	1.82045	0.00000
0.00000	1.69532	3.13255	4.09287	4.43009	4.09287	3.13255	1.69532	0.00000
0.00000	1.57880	2.91724	3.81156	4.12560	3.81156	2.91724	1.57880	0.00000
0.00000	1.47028	2.71673	3.54957	3.84203	3.54957	2.71673	1.47028	0.00000
0.00000	1.36922	2.53000	3.30560	3.57796	3.30560	2.53000	1.36922	0.00000
0.00000	1.27511	2.35610	3.07840	3.33203	3.07840	2.35610	1.27511	0.00000
0.00000	1.18747	2.19416	2.86681	3.10301	2.86681	2.19416	1.18747	0.00000
0.00000	1.10585	2.04335	2.66976	2.88973	2.66976	2.04335	1.10585	0.00000
0.00000	1.02984	1.90290	2.48626	2.69111	2.48626	1.90290	1.02984	0.00000
0.00000	0.95906	1.77211	2.31537	2.50614	2.31537	1.77211	0.95906	0.00000
0.00000	0.89314	1.65030	2.15623	2.33388	2.15623	1.65030	0.89314	0.00000
0.00000	0.83175	1.53687	2.00802	2.17347	2.00802	1.53687	0.83175	0.00000

14)d) k=0.25 por metodo implicito

0.00000	25.00000	50.00000	75.00000	100.00000	75.00000	50.00000	25.00000	0.00000
0.00000	24.60389	48.55412	70.11841	83.62727	70.11841	48.55412	24.60389	0.00000
0.00000	23.74772	46.08262	64.33914	73.05891	64.33914	46.08262	23.74772	0.00000
0.00000	22.54613	43.10944	58.76650	65.22781	58.76650	43.10944	22.54613	0.00000
0.00000	21.14575	39.98065	53.65252	58.88547	53.65252	39.98065	21.14575	0.00000
0.00000	19.66575	36.88927	49.01151	53.47533	49.01151	36.88927	19.66575	0.00000
0.00000	18.18683	33.93320	44.80156	48.72279	44.80156	33.93320	18.18683	0.00000
0.00000	16.75763	31.15686	40.97465	44.47743	40.97465	31.15686	16.75763	0.00000
0.00000	15.40445	28.57591	37.48840	40.64800	37.48840	28.57591	15.40445	0.00000
0.00000	14.13933	26.19099	34.30715	37.17372	34.30715	26.19099	14.13933	0.00000
0.00000	12.96580	23.99510	31.40083	34.01063	31.40083	23.99510	12.96580	0.00000
0.00000	11.88258	21.97766	28.74361	31.12472	28.74361	21.97766	11.88258	0.00000
0.00000	10.88576	20.12661	26.31294	28.48825	26.31294	20.12661	10.88576	0.00000
0.00000	9.97022	18.42964	24.08878	26.07769	24.08878	18.42964	9.97022	0.00000
0.00000	9.13033	16.87471	22.05318	23.87258	22.05318	16.87471	9.13033	0.00000
0.00000	8.36042	15.45037	20.18992	21.85477	20.18992	15.45037	8.36042	0.00000
0.00000	7.65499	14.14591	18.48426	20.00800	18.48426	14.14591	7.65499	0.00000
0.00000	7.00883	12.95139	16.92281	18.31756	16.92281	12.95139	7.00883	0.00000
0.00000	6.41707	11.85763	15.49331	16.77010	15.49331	11.85763	6.41707	0.00000
0.00000	5.87519	10.85618	14.18461	15.35345	14.18461	10.85618	5.87519	0.00000
0.00000	5.37902	9.93927	12.98647	14.05653	12.98647	9.93927	5.37902	0.00000
0.00000	4.92472	9.09978	11.88954	12.86919	11.88954	9.09978	4.92472	0.00000
0.00000	4.50878	8.33118	10.88528	11.78216	10.88528	8.33118	4.50878	0.00000
0.00000	4.12796	7.62750	9.96584	10.78696	9.96584	7.62750	4.12796	0.00000
0.00000	3.77930	6.98324	9.12407	9.87583	9.12407	6.98324	3.77930	0.00000
0.00000	3.46008	6.39341	8.35340	9.04166	8.35340	6.39341	3.46008	0.00000
0.00000	3.16783	5.85339	7.64782	8.27795	7.64782	5.85339	3.16783	0.00000
0.00000	2.90026	5.35898	7.00185	7.57875	7.00185	5.35898	2.90026	0.00000
0.00000	2.65529	4.90633	6.41043	6.93860	6.41043	4.90633	2.65529	0.00000
0.00000	2.43101	4.49192	5.86897	6.35253	5.86897	4.49192	2.43101	0.00000
0.00000	2.22567	4.11250	5.37325	5.81596	5.37325	4.11250	2.22567	0.00000
0.00000	2.03768	3.76514	4.91939	5.32471	4.91939	3.76514	2.03768	0.00000
0.00000	1.86557	3.44712	4.50388	4.87496	4.50388	3.44712	1.86557	0.00000
0.00000	1.70799	3.15595	4.12345	4.46319	4.12345	3.15595	1.70799	0.00000
0.00000	1.56372	2.88939	3.77516	4.08621	3.77516	2.88939	1.56372	0.00000
0.00000	1.43164	2.64533	3.45629	3.74107	3.45629	2.64533	1.43164	0.00000
0.00000	1.20001	2.21733	2.89708	3.13577	2.89708	2.21733	1.20001	0.00000
0.00000	1.09865	2.03004	2.65237	2.87091	2.65237	2.03004	1.09865	0.00000
0.00000	1.00585	1.85857	2.42834	2.62842	2.42834	1.85857	1.00585	0.00000
0.00000	0.92089	1.70159	2.22323	2.40641	2.22323	1.70159	0.92089	0.00000
0.00000	0.84311	1.55786	2.03544	2.20315	2.03544	1.55786	0.84311	0.00000
0.00000	1.31072	2.42189	3.16436	3.42507	3.16436	2.42189	1.31072	0.00000

14)d) k=0.25 por metodo explicito (NOTAR EL COMPORTAMIENTO INESTABLE. R=0.606 > 0.5)

0.0000e+00	2.5000e+01	5.0000e+01	7.5000e+01	1.0000e+02	7.5000e+01	5.0000e+01	2.5000e+01	0.0000e+00
0.0000e+00	2.5000e+01	5.0000e+01	7.5000e+01	6.9700e+01	7.5000e+01	5.0000e+01	2.5000e+01	0.0000e+00
0.0000e+00	2.5000e+01	5.0000e+01	5.6638e+01	7.6124e+01	5.6638e+01	5.0000e+01	2.5000e+01	0.0000e+00
0.0000e+00	2.5000e+01	3.8873e+01	6.4424e+01	5.2507e+01	6.4424e+01	3.8873e+01	2.5000e+01	0.0000e+00
0.0000e+00	1.8257e+01	4.5950e+01	4.1719e+01	6.6950e+01	4.1719e+01	4.5950e+01	1.8257e+01	0.0000e+00
0.0000e+00	2.3975e+01	2.6604e+01	5.9573e+01	3.6369e+01	5.9573e+01	2.6604e+01	2.3975e+01	0.0000e+00
0.0000e+00	1.1039e+01	4.4990e+01	2.5532e+01	6.4492e+01	2.5532e+01	4.4990e+01	1.1039e+01	0.0000e+00
0.0000e+00	2.4924e+01	1.2624e+01	6.0933e+01	1.7273e+01	6.0933e+01	1.2624e+01	2.4924e+01	0.0000e+00
0.0000e+00	2.3666e+00	4.9353e+01	5.2000e+00	7.0189e+01	5.2000e+00	4.9353e+01	2.3666e+00	0.0000e+00
0.0000e+00	2.9406e+01	-5.8775e+00	7.1340e+01	-8.5778e+00	7.1340e+01	-5.8775e+00	2.9406e+01	0.0000e+00
0.0000e+00	-9.7958e+00	6.2298e+01	-2.3884e+01	8.8283e+01	-2.3884e+01	6.2298e+01	-9.7958e+00	0.0000e+00
0.0000e+00	3.9829e+01	-3.3617e+01	9.6315e+01	-4.7663e+01	9.6315e+01	-3.3617e+01	3.9829e+01	0.0000e+00
0.0000e+00	-2.8816e+01	8.9631e+01	-6.9675e+01	1.2684e+02	-6.9675e+01	8.9631e+01	-2.8816e+01	0.0000e+00
0.0000e+00	6.0425e+01	-7.8687e+01	1.4595e+02	-1.1134e+02	1.4595e+02	-7.8687e+01	6.0425e+01	0.0000e+00
0.0000e+00	-6.0494e+01	1.4175e+02	-1.4610e+02	2.0050e+02	-1.4610e+02	1.4175e+02	-6.0494e+01	0.0000e+00
0.0000e+00	9.8723e+01	-1.5524e+02	2.3837e+02	-2.1957e+02	2.3837e+02	-1.5524e+02	9.8723e+01	0.0000e+00

0.0000e+00	-1.1501e+02	2.3719e+02	-2.7767e+02	3.3546e+02	-2.7767e+02	2.3719e+02	-1.1501e+02	0.0000e+00
0.0000e+00	1.6812e+02	-2.8825e+02	4.0589e+02	-4.0766e+02	4.0589e+02	-2.8825e+02	1.6812e+02	0.0000e+00
0.0000e+00	-2.1032e+02	4.0896e+02	-5.0777e+02	5.7836e+02	-5.0777e+02	4.0896e+02	-2.1032e+02	0.0000e+00
0.0000e+00	2.9242e+02	-5.2186e+02	7.0596e+02	-7.3803e+02	7.0596e+02	-5.2186e+02	2.9242e+02	0.0000e+00
0.0000e+00	-3.7824e+02	7.1565e+02	-9.1316e+02	1.0121e+03	-9.1316e+02	7.1565e+02	-3.7824e+02	0.0000e+00
0.0000e+00	5.1387e+02	-9.3430e+02	1.2406e+03	-1.3213e+03	1.2406e+03	-9.3430e+02	5.1387e+02	0.0000e+00
0.0000e+00	-6.7513e+02	1.2613e+03	-1.6299e+03	1.7837e+03	-1.6299e+03	1.2613e+03	-6.7513e+02	0.0000e+00
0.0000e+00	9.0746e+02	-1.6642e+03	2.1908e+03	-2.3536e+03	2.1908e+03	-1.6642e+03	9.0746e+02	0.0000e+00
0.0000e+00	-1.2009e+03	2.2304e+03	-2.8993e+03	3.1542e+03	-2.8993e+03	2.2304e+03	-1.2009e+03	0.0000e+00
0.0000e+00	1.6062e+03	-2.9575e+03	3.8777e+03	-4.1826e+03	3.8777e+03	-2.9575e+03	1.6062e+03	0.0000e+00
0.0000e+00	-2.1328e+03	3.9503e+03	-5.1490e+03	5.5865e+03	-5.1490e+03	3.9503e+03	-2.1328e+03	0.0000e+00
0.0000e+00	2.8460e+03	-5.2502e+03	6.8709e+03	-7.4249e+03	6.8709e+03	-5.2502e+03	2.8460e+03	0.0000e+00
0.0000e+00	-3.7850e+03	7.0015e+03	-9.1378e+03	9.9016e+03	-9.1378e+03	7.0015e+03	-3.7850e+03	0.0000e+00
0.0000e+00	5.0453e+03	-9.3155e+03	1.2180e+04	-1.3174e+04	1.2180e+04	-9.3155e+03	5.0453e+03	0.0000e+00
0.0000e+00	-6.7148e+03	1.2414e+04	-1.6211e+04	1.7556e+04	-1.6211e+04	1.2414e+04	-6.7148e+03	0.0000e+00
0.0000e+00	8.9462e+03	-1.6525e+04	2.1598e+04	-2.3369e+04	2.1598e+04	-1.6525e+04	8.9462e+03	0.0000e+00
0.0000e+00	-1.1911e+04	2.2013e+04	-2.8755e+04	3.1131e+04	-2.8755e+04	2.2013e+04	-1.1911e+04	0.0000e+00
0.0000e+00	1.5865e+04	-2.9310e+04	3.8302e+04	-4.1451e+04	3.8302e+04	-2.9310e+04	1.5865e+04	0.0000e+00
0.0000e+00	-2.1125e+04	3.9039e+04	-5.1001e+04	5.5209e+04	-5.1001e+04	3.9039e+04	-2.1125e+04	0.0000e+00
0.0000e+00	2.8136e+04	-5.1985e+04	6.7926e+04	-7.3517e+04	6.7926e+04	-5.1985e+04	2.8136e+04	0.0000e+00
0.0000e+00	-3.7467e+04	6.9234e+04	-9.0454e+04	9.7912e+04	-9.0454e+04	6.9234e+04	-3.7467e+04	0.0000e+00
0.0000e+00	4.9899e+04	-9.2198e+04	1.2047e+05	-1.3039e+05	1.2047e+05	-9.2198e+04	4.9899e+04	0.0000e+00
0.0000e+00	-6.6451e+04	1.2279e+05	-1.6043e+05	1.7365e+05	-1.6043e+05	1.2279e+05	-6.6451e+04	0.0000e+00
0.0000e+00	8.8497e+04	-1.6352e+05	2.1365e+05	-2.3125e+05	2.1365e+05	-1.6352e+05	8.8497e+04	0.0000e+00
0.0000e+00	-1.1785e+05	2.1777e+05	-2.8452e+05	3.0797e+05	-2.8452e+05	2.1777e+05	-1.1785e+05	0.0000e+00