

Modelado matemático en Farmacia mediante hoja de cálculo

a= 1  
b= 0.5

xo	yo	Q(xo,yo)
10	5	0.5

$\Delta x$	xo+ $\Delta x$	Q(xo+ $\Delta x$ ,yo)	$\Delta Q/\Delta x$
1.000000	11.00000	0.476190	-0.023810
0.500000	10.50000	0.487805	-0.024390
0.250000	10.25000	0.493827	-0.024691
0.125000	10.12500	0.496894	-0.024845
0.062500	10.06250	0.498442	-0.024922
0.031250	10.03125	0.499220	-0.024961
0.015625	10.01563	0.499610	-0.024980
0.007813	10.00781	0.499805	-0.024990
0.003906	10.00391	0.499902	-0.024995
0.001953	10.00195	0.499951	-0.024998
0.000977	10.00098	0.499976	-0.024999
0.000488	10.00049	0.499988	-0.024999
0.000244	10.00024	0.499994	-0.025000
0.000122	10.00012	0.499997	-0.025000
0.000061	10.00006	0.499998	-0.025000

xo	yo	Q' <sub>x</sub> (xo,yo)
10	5	-0.025000

$\Delta y$	yo+ $\Delta y$	Q(xo,yo+ $\Delta y$ )	$\Delta Q/\Delta y$
1.000000	6.00000	0.545455	0.045455
0.500000	5.50000	0.523810	0.047619
0.250000	5.25000	0.512195	0.048780
0.125000	5.12500	0.506173	0.049383
0.062500	5.06250	0.503106	0.049689
0.031250	5.03125	0.501558	0.049844
0.015625	5.01563	0.500780	0.049922
0.007813	5.00781	0.500390	0.049961
0.003906	5.00391	0.500195	0.049980
0.001953	5.00195	0.500098	0.049990
0.000977	5.00098	0.500049	0.049995
0.000488	5.00049	0.500024	0.049998
0.000244	5.00024	0.500012	0.049999
0.000122	5.00012	0.500006	0.049999
0.000061	5.00006	0.500003	0.050000

xo	yo	Q' <sub>y</sub> (xo,yo)
10	5	0.050000

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**Evaluación de Q(x,y)**

x	y									
	4.6	4.7	4.8	4.9	5	5.1	5.2	5.3	5.4	5.5
9.6	0.48936	0.49474	0.50000	0.50515	0.51020	0.51515	0.52000	0.52475	0.52941	0.53398
9.7	0.48677	0.49215	0.49741	0.50256	0.50761	0.51256	0.51741	0.52217	0.52683	0.53140
9.8	0.48421	0.48958	0.49485	0.50000	0.50505	0.51000	0.51485	0.51961	0.52427	0.52885
9.9	0.48168	0.48705	0.49231	0.49746	0.50251	0.50746	0.51232	0.51707	0.52174	0.52632
10	0.47917	0.48454	0.48980	0.49495	<b>0.50000</b>	0.50495	0.50980	0.51456	0.51923	0.52381
10.1	0.47668	0.48205	0.48731	0.49246	0.49751	0.50246	0.50732	0.51208	0.51675	0.52133
10.2	0.47423	0.47959	0.48485	0.49000	0.49505	0.50000	0.50485	0.50962	0.51429	0.51887
10.3	0.47179	0.47716	0.48241	0.48756	0.49261	0.49756	0.50242	0.50718	0.51185	0.51643
10.4	0.46939	0.47475	0.48000	0.48515	0.49020	0.49515	0.50000	0.50476	0.50943	0.51402
10.5	0.46701	0.47236	0.47761	0.48276	0.48780	0.49275	0.49761	0.50237	0.50704	0.51163

$Q'_x(10,5)$	-0.025000
$Q'_y(10,5)$	0.05

**Aproximación de Q utilizando dQ(10,5)**

x	y									
	4.6	4.7	4.8	4.9	5	5.1	5.2	5.3	5.4	5.5
9.6	0.49000	0.49500	0.50000	0.50500	0.51000	0.51500	0.52000	0.52500	0.53000	0.53500
9.7	0.48750	0.49250	0.49750	0.50250	0.50750	0.51250	0.51750	0.52250	0.52750	0.53250
9.8	0.48500	0.49000	0.49500	0.50000	0.50500	0.51000	0.51500	0.52000	0.52500	0.53000
9.9	0.48250	0.48750	0.49250	0.49750	0.50250	0.50750	0.51250	0.51750	0.52250	0.52750
10	0.48000	0.48500	0.49000	0.49500	<b>0.50000</b>	0.50500	0.51000	0.51500	0.52000	0.52500
10.1	0.47750	0.48250	0.48750	0.49250	0.49750	0.50250	0.50750	0.51250	0.51750	0.52250
10.2	0.47500	0.48000	0.48500	0.49000	0.49500	0.50000	0.50500	0.51000	0.51500	0.52000
10.3	0.47250	0.47750	0.48250	0.48750	0.49250	0.49750	0.50250	0.50750	0.51250	0.51750
10.4	0.47000	0.47500	0.48000	0.48500	0.49000	0.49500	0.50000	0.50500	0.51000	0.51500
10.5	0.46750	0.47250	0.47750	0.48250	0.48750	0.49250	0.49750	0.50250	0.50750	0.51250

**Comparación entre Q y su aproximación: Q(x,y) – Aproximación\_de\_Q (x,y)**

x	y									
	4.6	4.7	4.8	4.9	5	5.1	5.2	5.3	5.4	5.5
9.6	-0.00064	-0.00026	0.00000	0.00015	0.00020	0.00015	0.00000	-0.00025	-0.00059	-0.00102
9.7	-0.00073	-0.00035	-0.00009	0.00006	0.00011	0.00006	-0.00009	-0.00033	-0.00067	-0.00110
9.8	-0.00079	-0.00042	-0.00015	0.00000	0.00005	0.00000	-0.00015	-0.00039	-0.00073	-0.00115
9.9	-0.00082	-0.00045	-0.00019	-0.00004	0.00001	-0.00004	-0.00018	-0.00043	-0.00076	-0.00118
10	-0.00083	-0.00046	-0.00020	-0.00005	<b>0.00000</b>	-0.00005	-0.00020	-0.00044	-0.00077	-0.00119
10.1	-0.00082	-0.00045	-0.00019	-0.00004	0.00001	-0.00004	-0.00018	-0.00042	-0.00075	-0.00117
10.2	-0.00077	-0.00041	-0.00015	0.00000	0.00005	0.00000	-0.00015	-0.00038	-0.00071	-0.00113
10.3	-0.00071	-0.00034	-0.00009	0.00006	0.00011	0.00006	-0.00008	-0.00032	-0.00065	-0.00107
10.4	-0.00061	-0.00025	0.00000	0.00015	0.00020	0.00015	0.00000	-0.00024	-0.00057	-0.00098

10.5	-0.00049	-0.00014	0.00011	0.00026	0.00030	0.00025	0.00011	-0.00013	-0.00046	-0.00087
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### Errores Absolutos

Errores absolutos reales :  $Q(x,y) - Q(10,5)$

x	y									
	4.6	4.7	4.8	4.9	5	5.1	5.2	5.3	5.4	5.5
9.6	-0.01064	-0.00526	0.00000	0.00515	0.01020	0.01515	0.02000	0.02475	0.02941	0.03398
9.7	-0.01323	-0.00785	-0.00259	0.00256	0.00761	0.01256	0.01741	0.02217	0.02683	0.03140
9.8	-0.01579	-0.01042	-0.00515	0.00000	0.00505	0.01000	0.01485	0.01961	0.02427	0.02885
9.9	-0.01832	-0.01295	-0.00769	-0.00254	0.00251	0.00746	0.01232	0.01707	0.02174	0.02632
10	-0.02083	-0.01546	-0.01020	-0.00505	<b>0.00000</b>	0.00495	0.00980	0.01456	0.01923	0.02381
10.1	-0.02332	-0.01795	-0.01269	-0.00754	-0.00249	0.00246	0.00732	0.01208	0.01675	0.02133
10.2	-0.02577	-0.02041	-0.01515	-0.01000	-0.00495	0.00000	0.00485	0.00962	0.01429	0.01887
10.3	-0.02821	-0.02284	-0.01759	-0.01244	-0.00739	-0.00244	0.00242	0.00718	0.01185	0.01643
10.4	-0.03061	-0.02525	-0.02000	-0.01485	-0.00980	-0.00485	0.00000	0.00476	0.00943	0.01402
10.5	-0.03299	-0.02764	-0.02239	-0.01724	-0.01220	-0.00725	-0.00239	0.00237	0.00704	0.01163

Errores absolutos aproximados a través de  $dQ(10,5)$

x	y									
	4.6	4.7	4.8	4.9	5	5.1	5.2	5.3	5.4	5.5
9.6	-0.01000	-0.00500	0.00000	0.00500	0.01000	0.01500	0.02000	0.02500	0.03000	0.03500
9.7	-0.01250	-0.00750	-0.00250	0.00250	0.00750	0.01250	0.01750	0.02250	0.02750	0.03250
9.8	-0.01500	-0.01000	-0.00500	0.00000	0.00500	0.01000	0.01500	0.02000	0.02500	0.03000
9.9	-0.01750	-0.01250	-0.00750	-0.00250	0.00250	0.00750	0.01250	0.01750	0.02250	0.02750
10	-0.02000	-0.01500	-0.01000	-0.00500	<b>0.00000</b>	0.00500	0.01000	0.01500	0.02000	0.02500
10.1	-0.02250	-0.01750	-0.01250	-0.00750	-0.00250	0.00250	0.00750	0.01250	0.01750	0.02250
10.2	-0.02500	-0.02000	-0.01500	-0.01000	-0.00500	0.00000	0.00500	0.01000	0.01500	0.02000
10.3	-0.02750	-0.02250	-0.01750	-0.01250	-0.00750	-0.00250	0.00250	0.00750	0.01250	0.01750
10.4	-0.03000	-0.02500	-0.02000	-0.01500	-0.01000	-0.00500	0.00000	0.00500	0.01000	0.01500
10.5	-0.03250	-0.02750	-0.02250	-0.01750	-0.01250	-0.00750	-0.00250	0.00250	0.00750	0.01250