Eliton Machado da Silva

9)

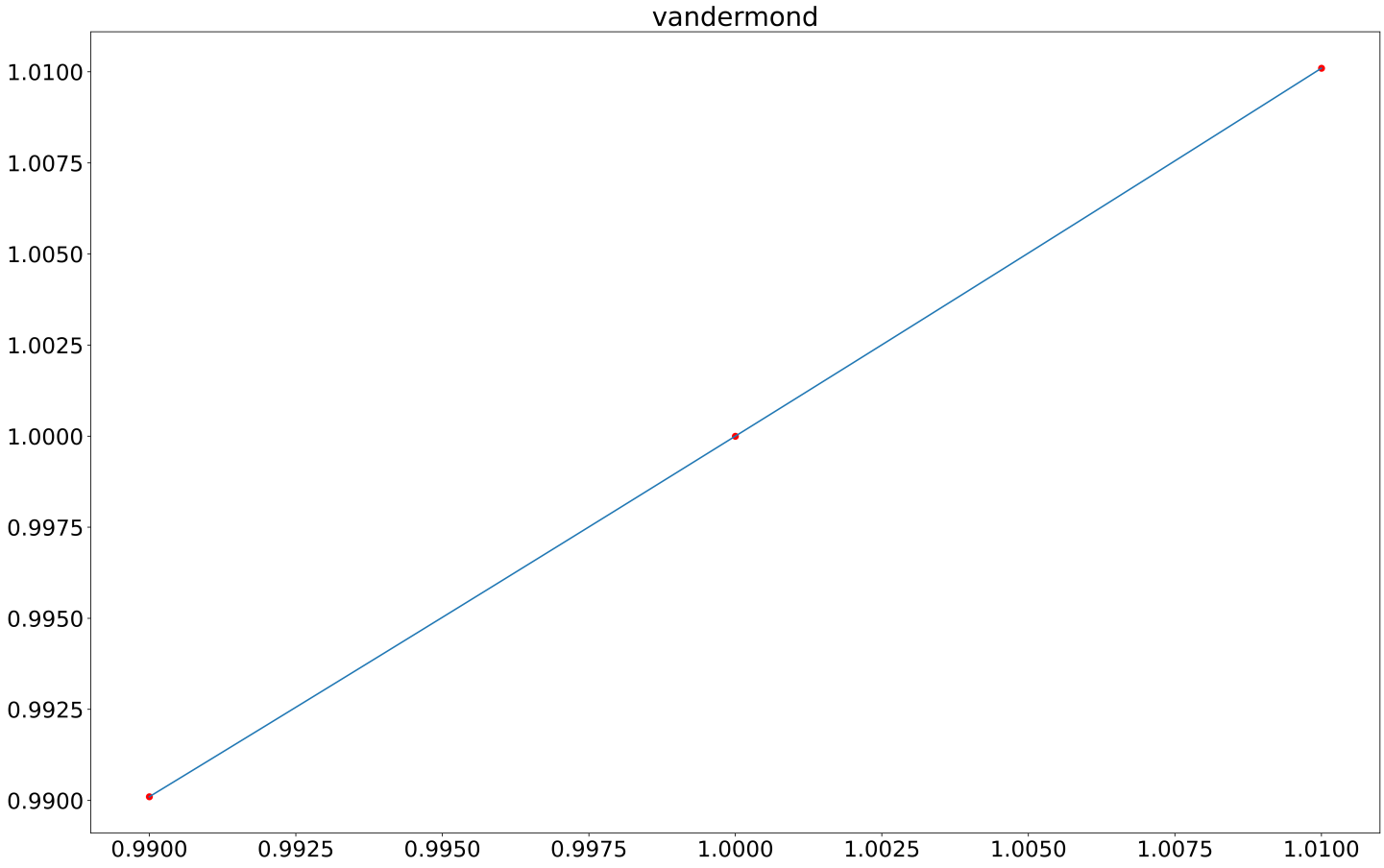
Usado o Algoritmo de Vandermond para interpolar o pontos e as funções:

$F_1(x,h) = \frac{P(x+h)-P(x-h)}{2h}$, Primeira derivada

$F_2(x,h) = \frac{P(x+h)-2P(x)+P(x-h)}{h^2}$, Segunda derivada

$F_3(x,h) = \frac{-\frac{1}{2}P(x-2h)+P(x-h)-P(x+h)+\frac{1}{2}P(x+2h)}{h^3}$, Terceira derivada

Questão 1:



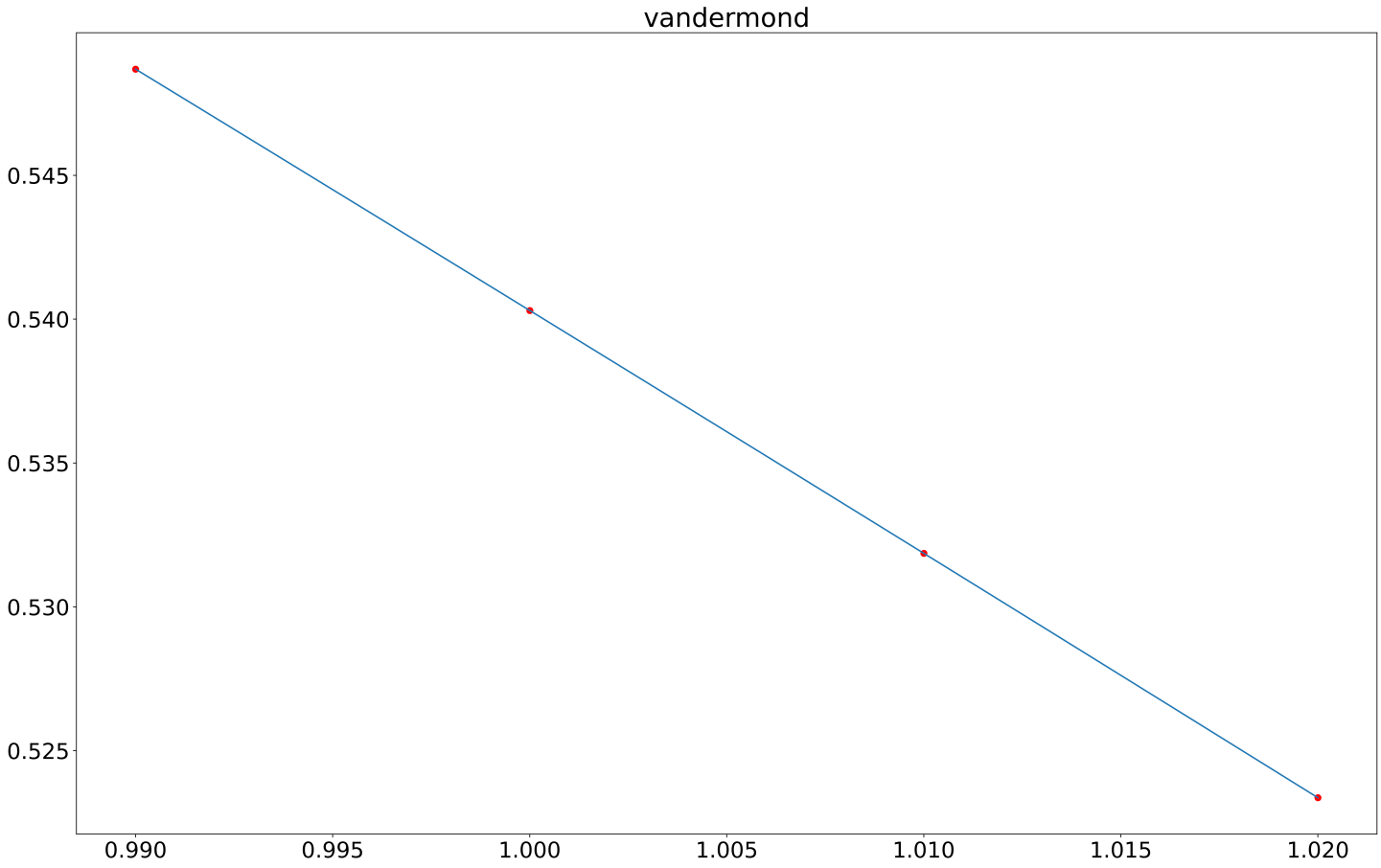
Polinômio:

$P(x) = +0.9999833332505028 * x**0 - 1.0000166673343294 * x**1 + 1.0000333340838266 * x**2$

h	$F_1(1)$	$F_2(1)$
0.5	1.000050000833324	2.0000666681676544

h	$F_1(1)$	$F_2(1)$
0.25	1.0000500008333235	2.000066668167655
0.125	1.000050000833324	2.000066668167655
0.0625	1.0000500008333244	2.000066668167676
0.03125	1.0000500008333244	2.000066668167733
0.015625	1.000050000833319	2.0000666681671646
0.0078125	1.000050000833312	2.000066668166255
0.00390625	1.0000500008333262	2.000066668166255
0.001953125	1.000050000833312	2.0000666681444272
0.0009765625	1.000050000833312	2.000066668028012

Questão 2:

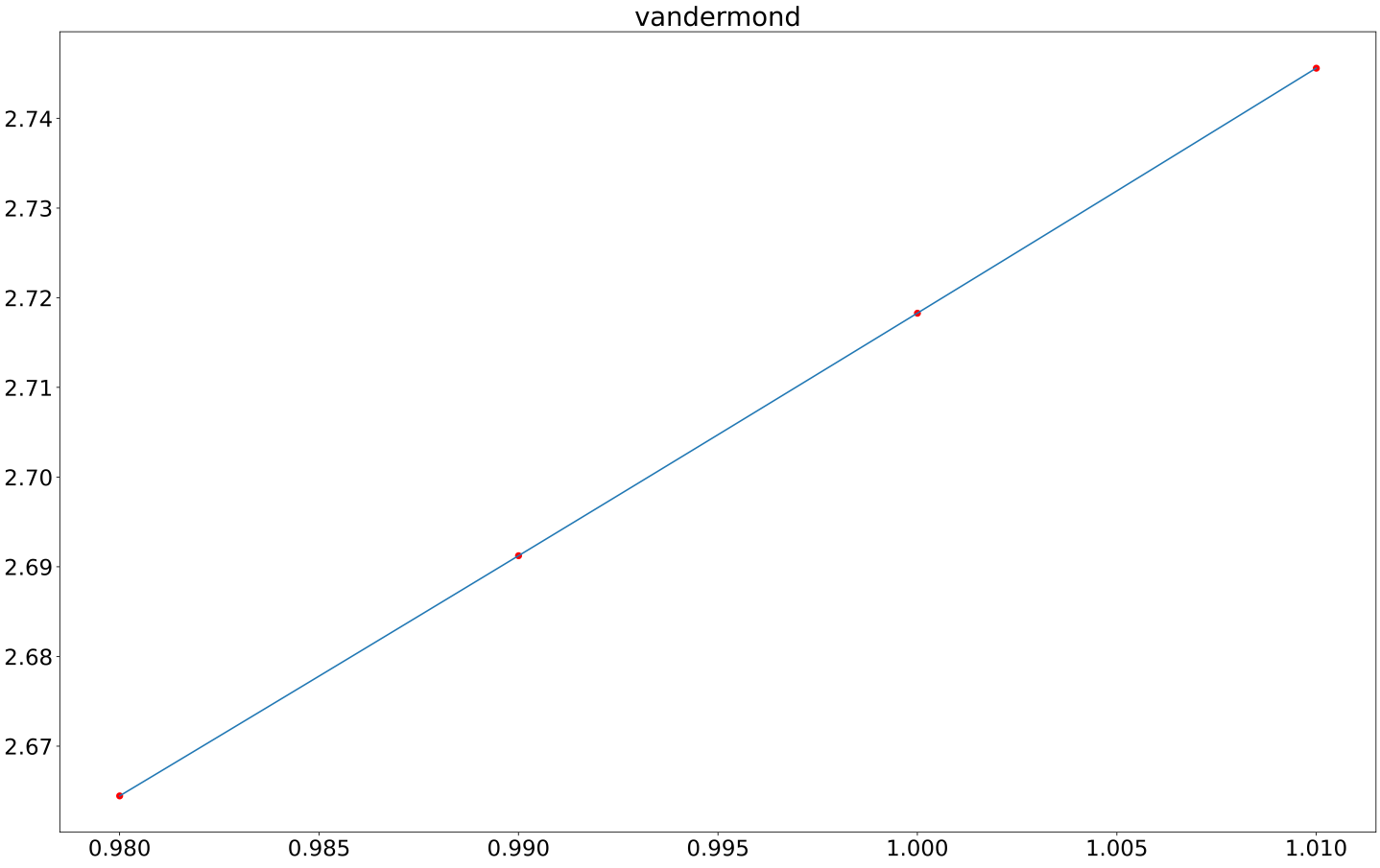


Polinômio:

$P(x) = +0.9709325312615683 * x * *0 + 0.12090248124074118 * x * *1 - 0.6922246091099179 * x * *2 + 0.14069190247574834 * x * *3$

h	$F_1(1)$	$F_2(1)$	$F_3(1)$
0.5	-0.8062980539329125	-0.5402978033653456	0.84415141485449
0.25	-0.832677785647115	-0.54029780336535	0.8441514148544798
0.125	-0.8392727185756661	-0.5402978033653483	0.8441514148545366
0.0625	-0.8409214518078043	-0.5402978033653483	0.844151414854764
0.03125	-0.8413336351158396	-0.5402978033654335	0.8441514148562419
0.015625	-0.8414366809428451	-0.5402978033666841	0.8441514148289571
0.0078125	-0.8414624423996031	-0.5402978033671388	0.8441514150472358
0.00390625	-0.8414688827637917	-0.5402978033816908	0.8441514149308205
0.001953125	-0.8414704928548815	-0.5402978033816908	0.8441514372825623
0.0009765625	-0.8414708953775403	-0.5402978033525869	0.8441511988639832

Questão 3:



Polinômio:

$P(x) = +0.9083589897994355 * x * *0 + 1.352356648258872 * x * *1 + 0.006773165380873816 * x * *2 + 0.4507930250198633 5 * x * *3$

h	$F_1(1)$	$F_2(1)$	$F_3(1)$
0.5	2.8309803103351756	2.7183044808809242	2.704758150119183
0.25	2.7464566181439505	2.718304480880917	2.704758150119204
0.125	2.7253256950961475	2.718304480880846	2.704758150118778
0.0625	2.720042964334194	2.718304480880647	2.704758150120142
0.03125	2.7187222816437	2.718304480880306	2.7047581501319655
0.015625	2.718392110971081	2.718304480880761	2.7047581500955857
0.0078125	2.718309568302942	2.718304480869847	2.704758149571717
0.00390625	2.718288932635801	2.718304480833467	2.7047581635415554
0.001953125	2.718283773719122	2.718304480658844	2.704758107662201
0.0009765625	2.718282483989924	2.718304479960352	2.7047581672668457