Sheet 3 - Answers

Timm & Boris

June 19, 2014
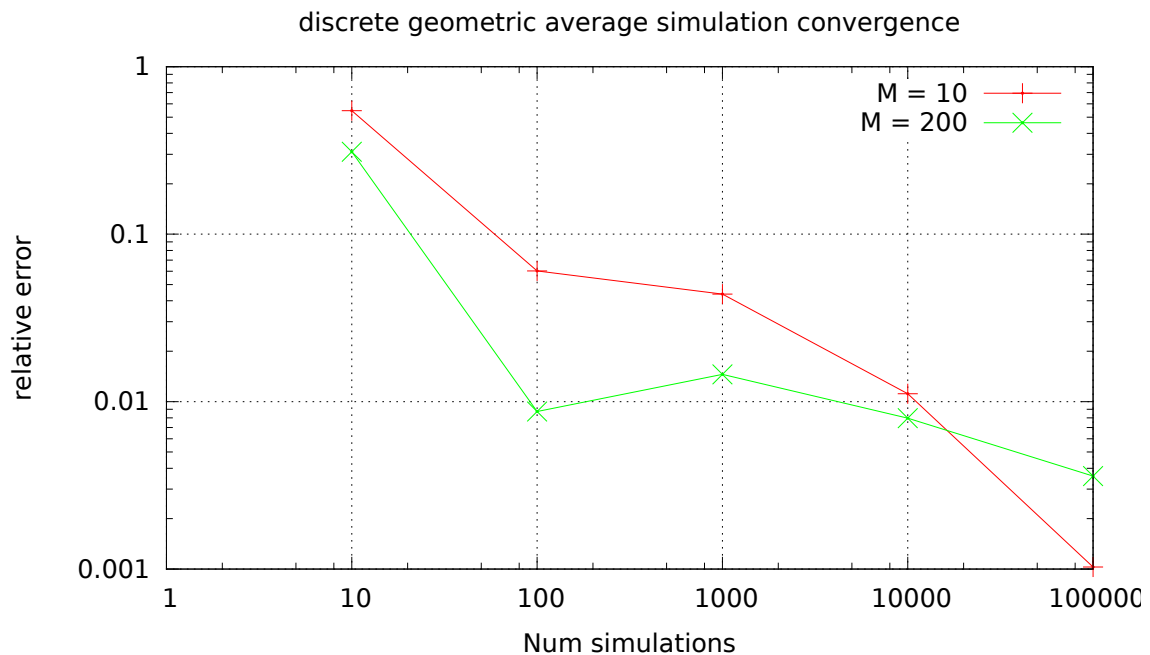
Task: 1

Wird vielleicht noch nachgereicht, falls ich den Beweis noch hinkriege.
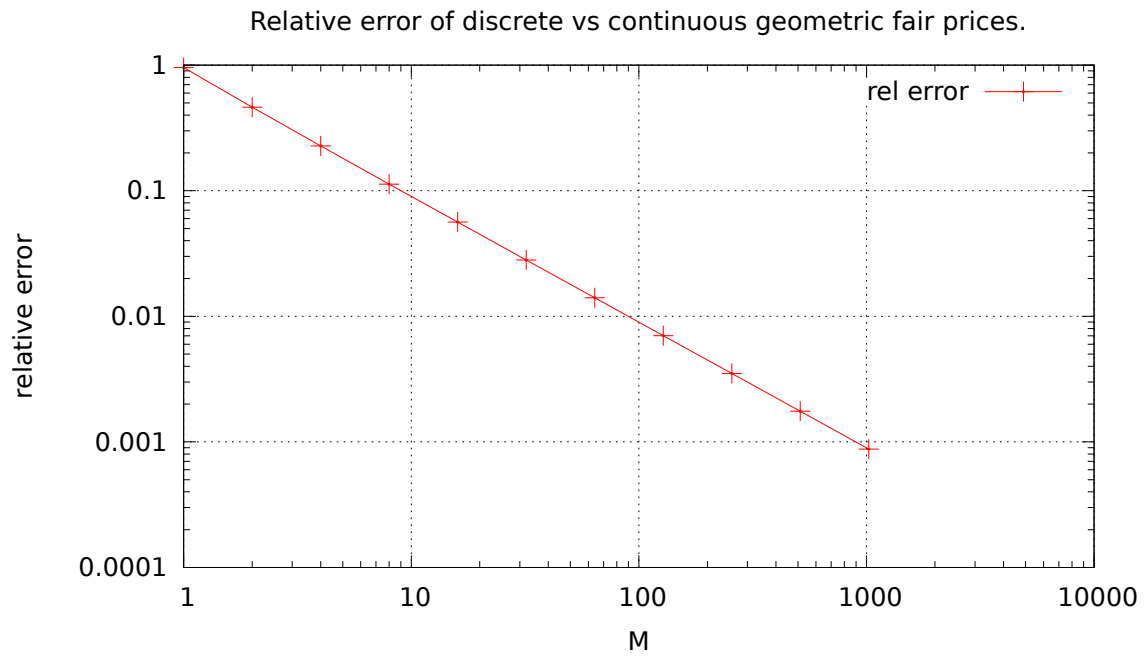Momentaner Ansatz befindet sich im Ordner BaSheet03/Task01.
  Timm

Task: 3

We assume that the convergence should go to zero. This is maybe connected to the fact that our implementation of the closed solution differs from the closed solution is given by the side "http://www.quantcalc.net/DGA.html" but our simulation doesn't converge either way.
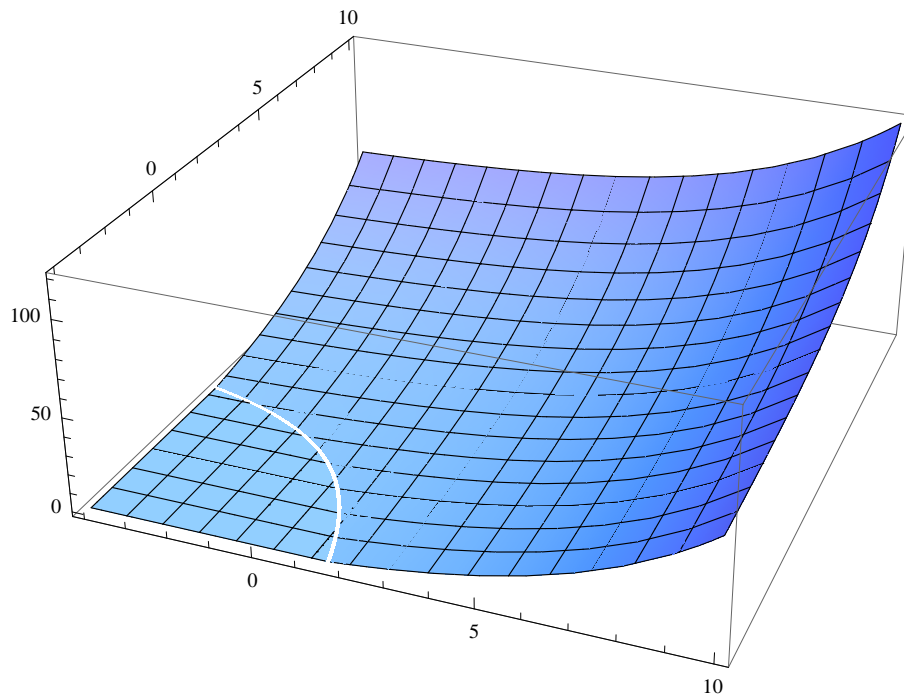
This behavior is not desired. We would expect the error getting smaler, but this is maybe connected to behavior in task 3.
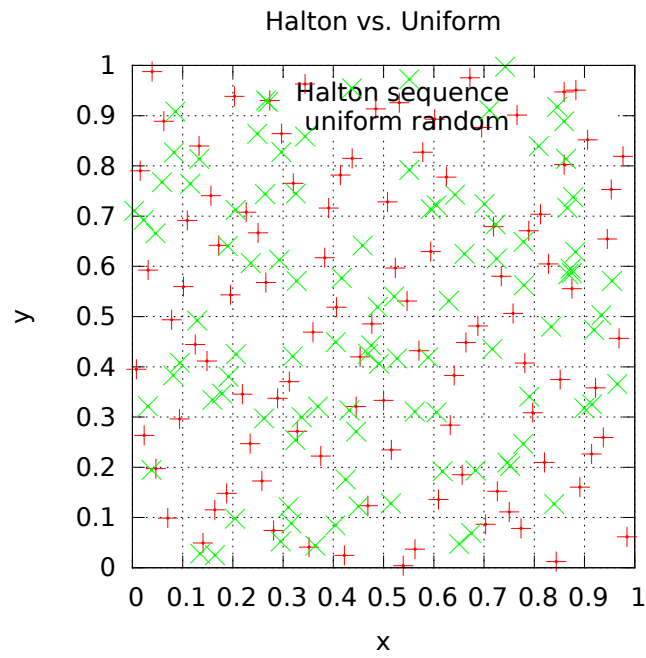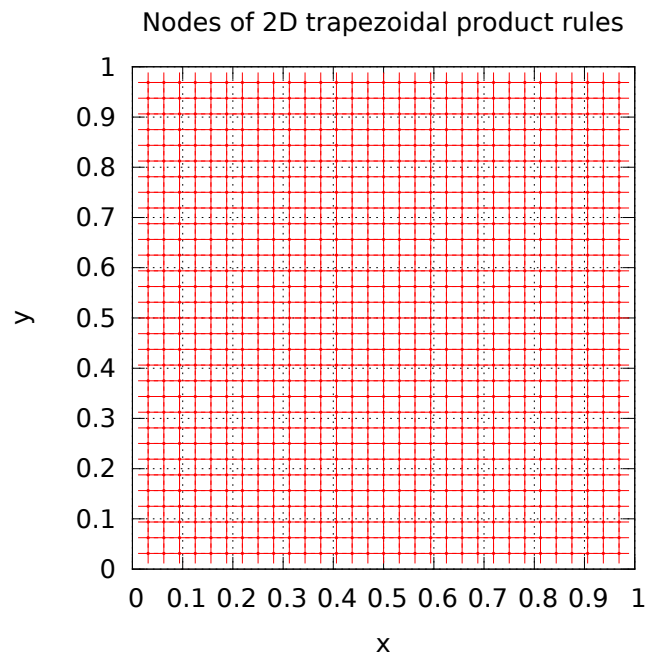
Task: 4

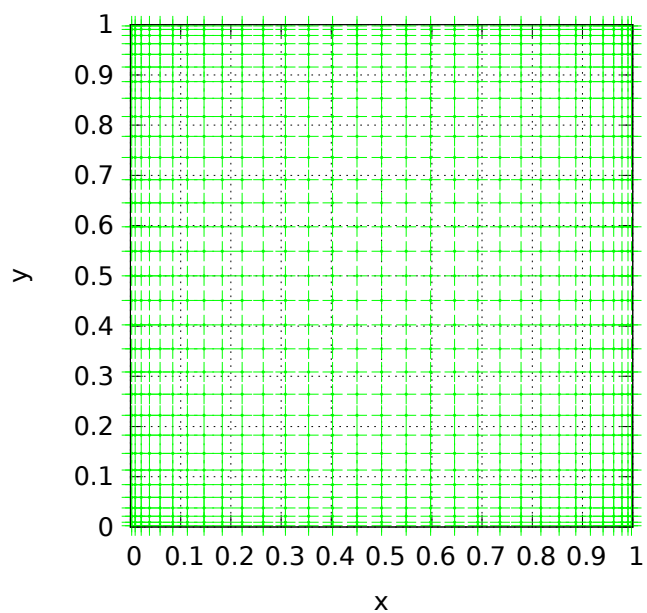Relative error of discrete vs continuous geometric fair prices.

Task: 5

Task: 7

Halton vs. Uniform
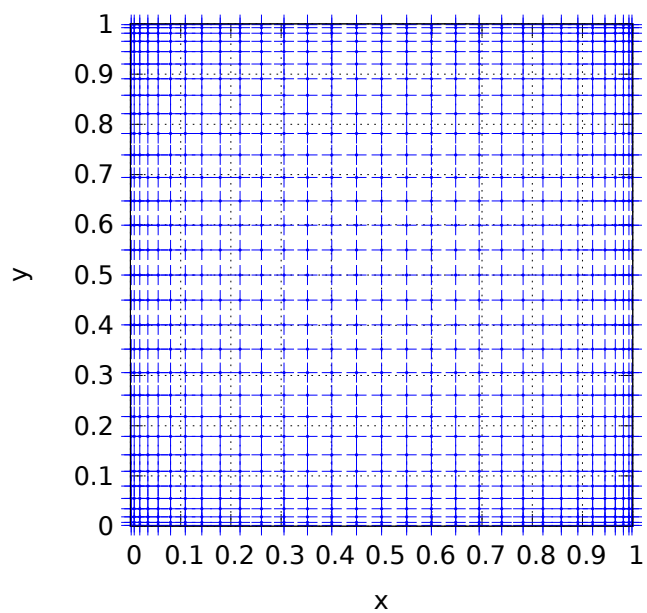

Task: 9

Nodes of 2D trapezoidal product rules
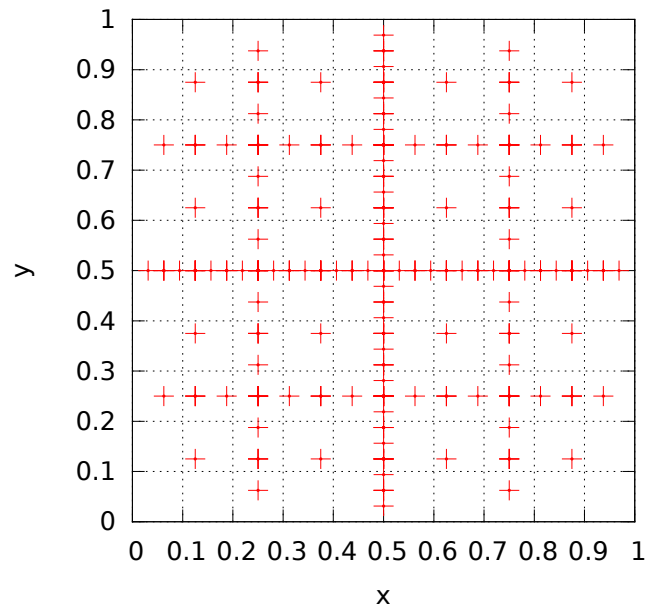
Nodes of 2D Clenshaw-Curtis product rules
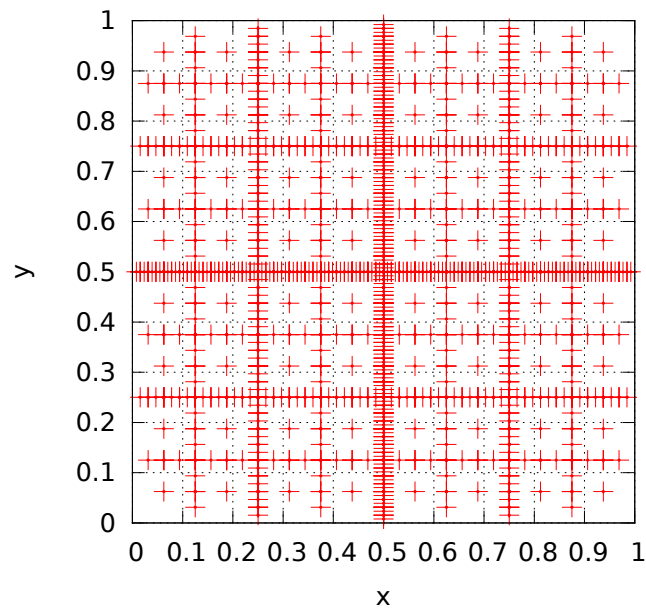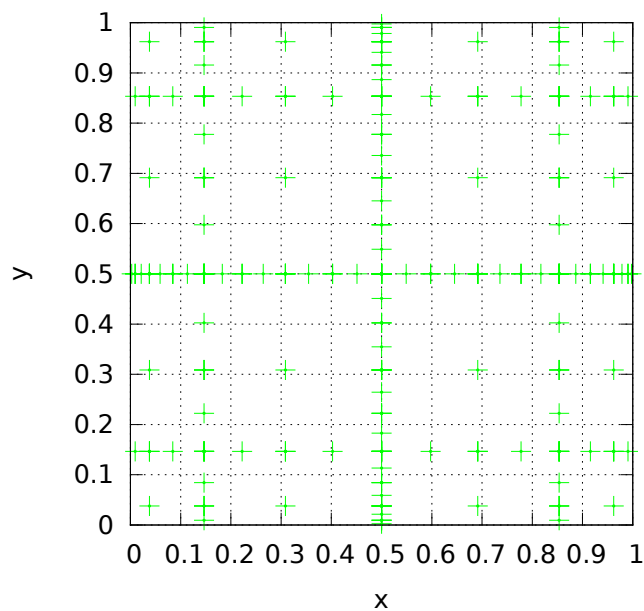

Nodes of 2D Gauss-Legendre product rules

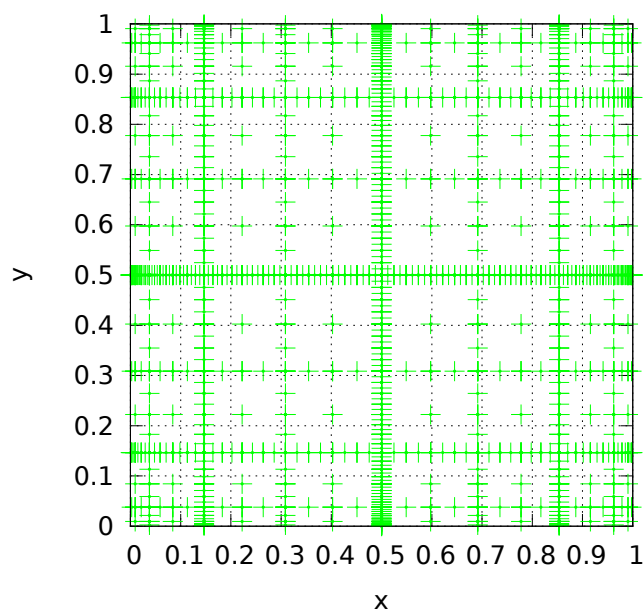**Task: 11**

Nodes of 2D trapezoidal sparse grid with l = 5
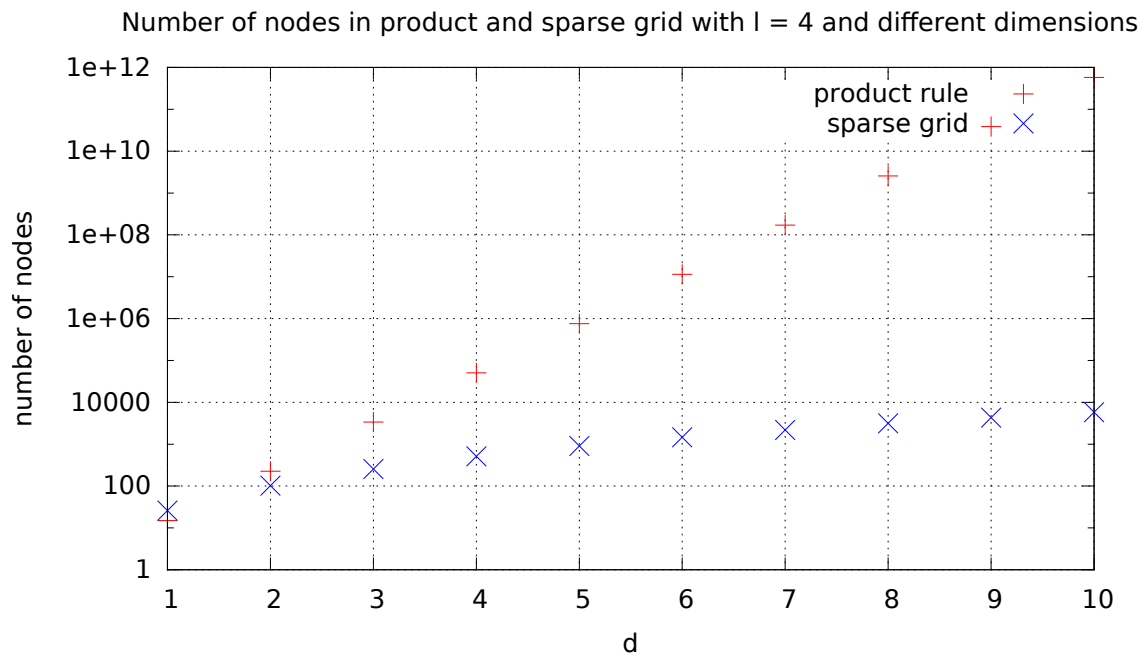

Nodes of 2D trapezoidal sparse grid with l = 7
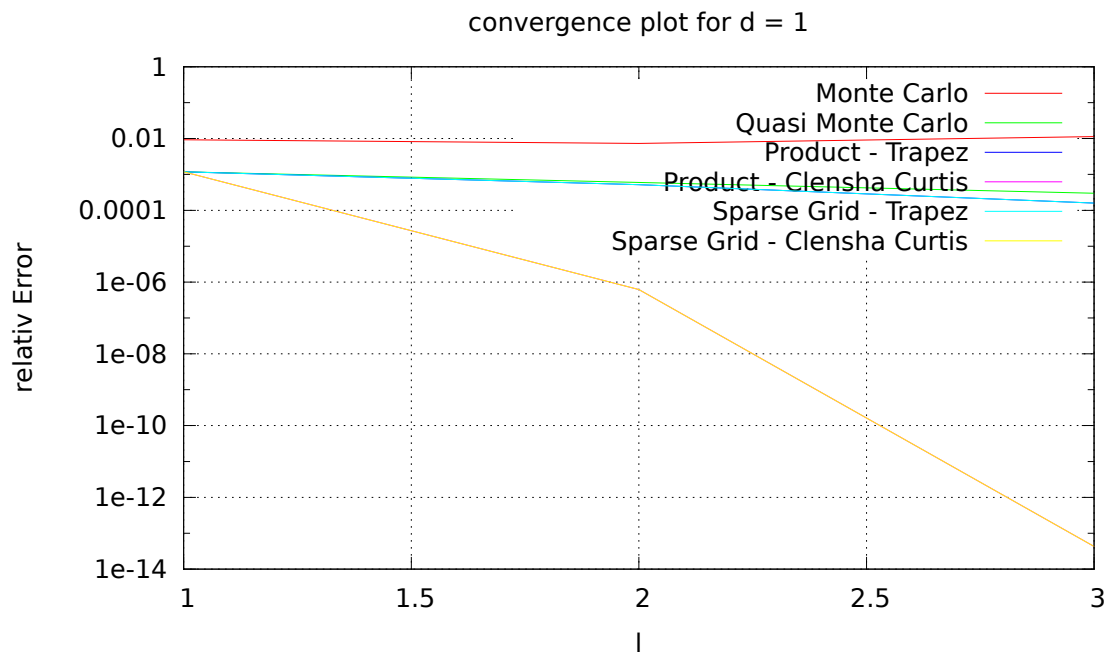
Nodes of 2D Clenshaw-Curtis sparse grid with l = 5

Nodes of 2D Clenshaw-Curtis sparse grid with l = 7

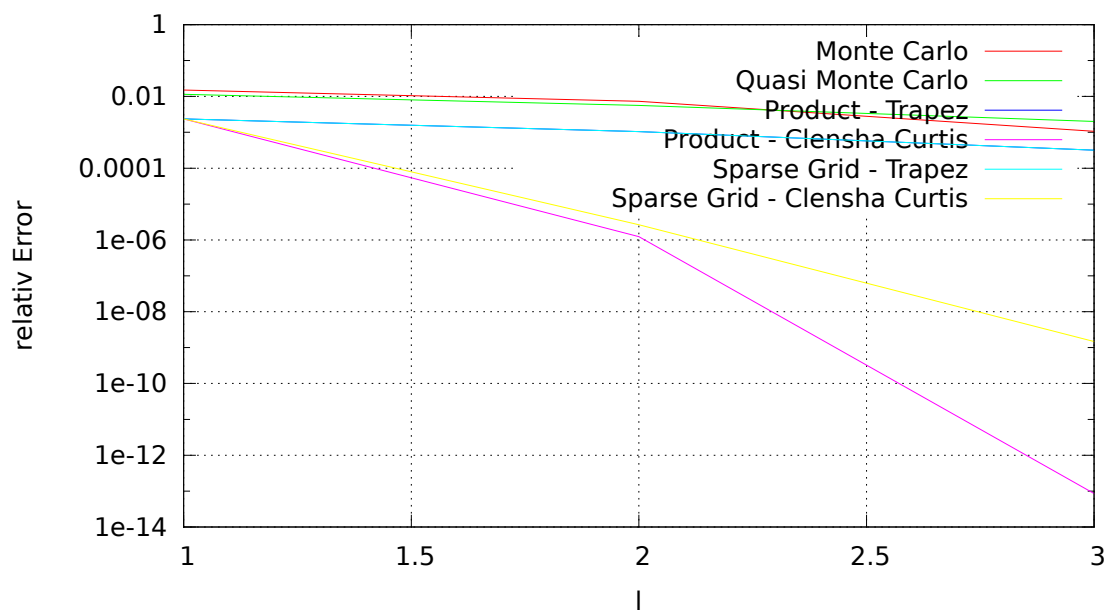## Task: 12

Number of nodes in product and sparse grid with l = 4 and different dimensions

Task: 13

convergence plot for d = 1

convergence plot for d = 2

	Monte Carlo
	Quasi Monte Carlo
	Product - Trapez
	Product - Clensha Curtis
	Sparse Grid - Trapez
	Sparse Grid - Clensha Curtis

convergence plot for d = 4

	Monte Carlo
	Quasi Monte Carlo
	Product - Trapez
	Product - Clensha Curtis
	Sparse Grid - Trapez
	Sparse Grid - Clensha Curtis

convergence plot for d = 8
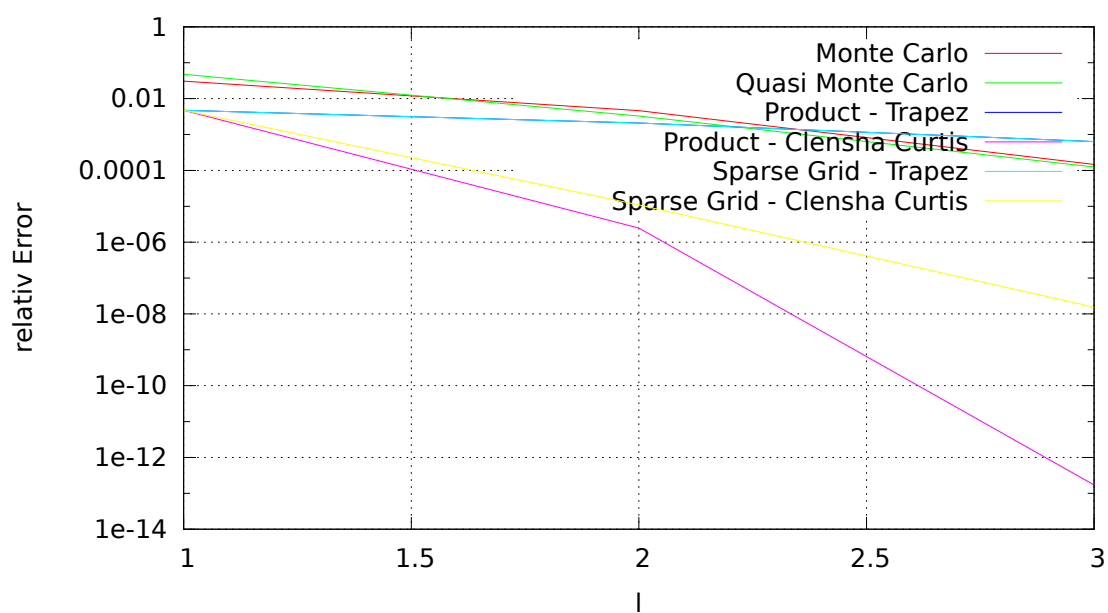
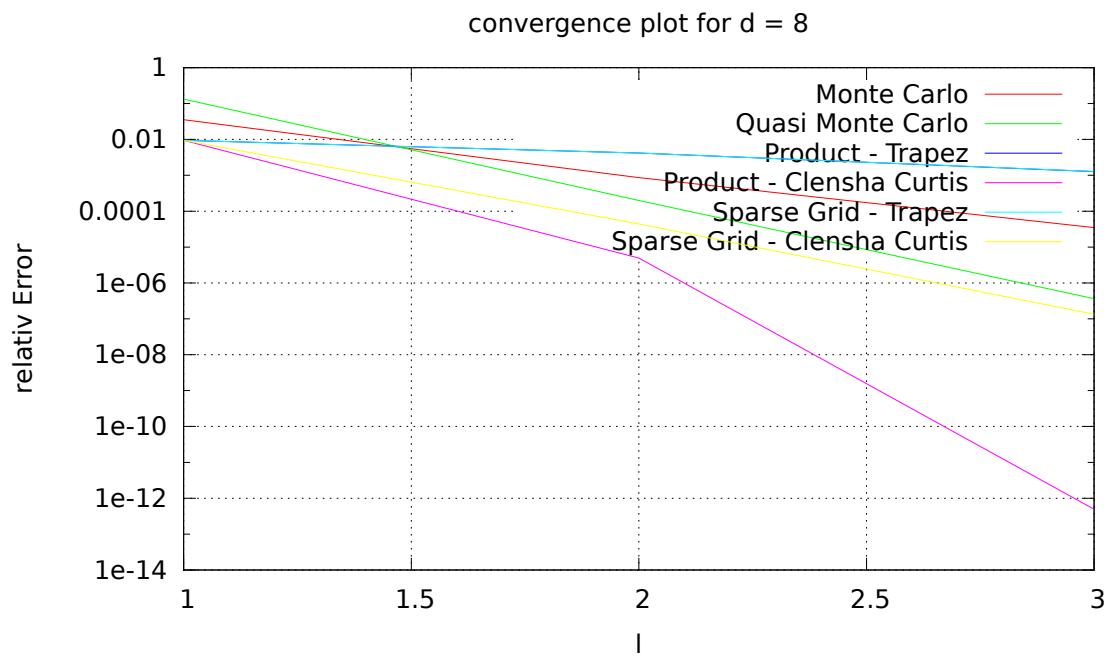## Task: 15

With level 4 and the given values the integration of both simulations is 10.4889.

Task: 16

convergence plot of discrete geom. asien options (random walk vs. brownian bridg
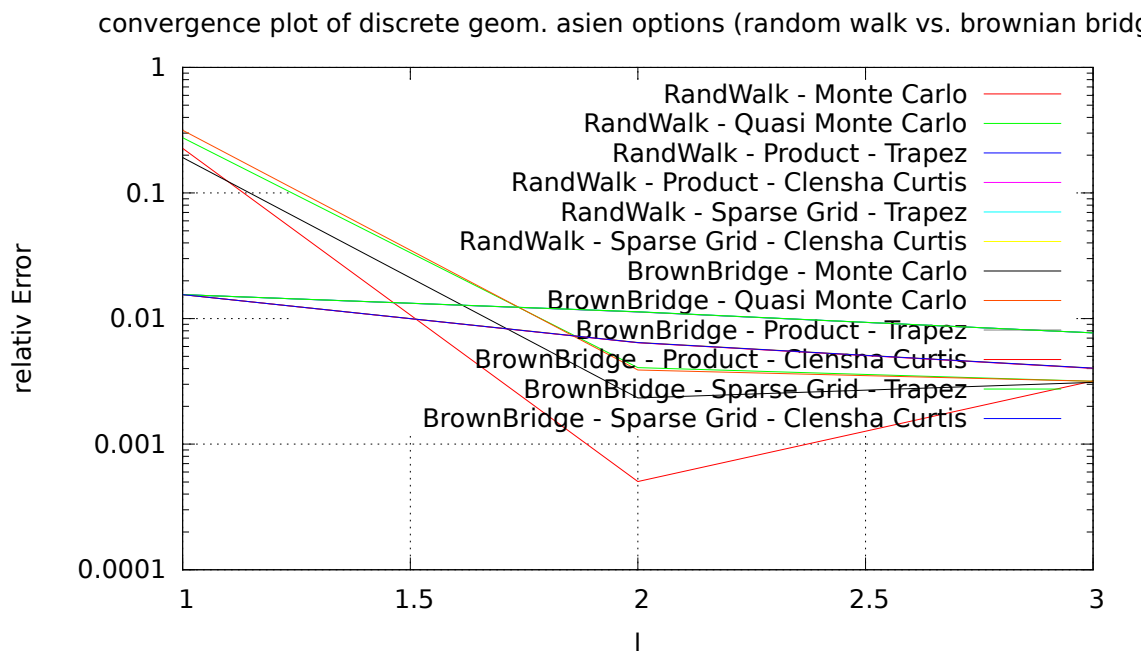
Task: 17

We can't explait this behavior, but we are aware of its wrong nature :)

convergence plot for M = 64
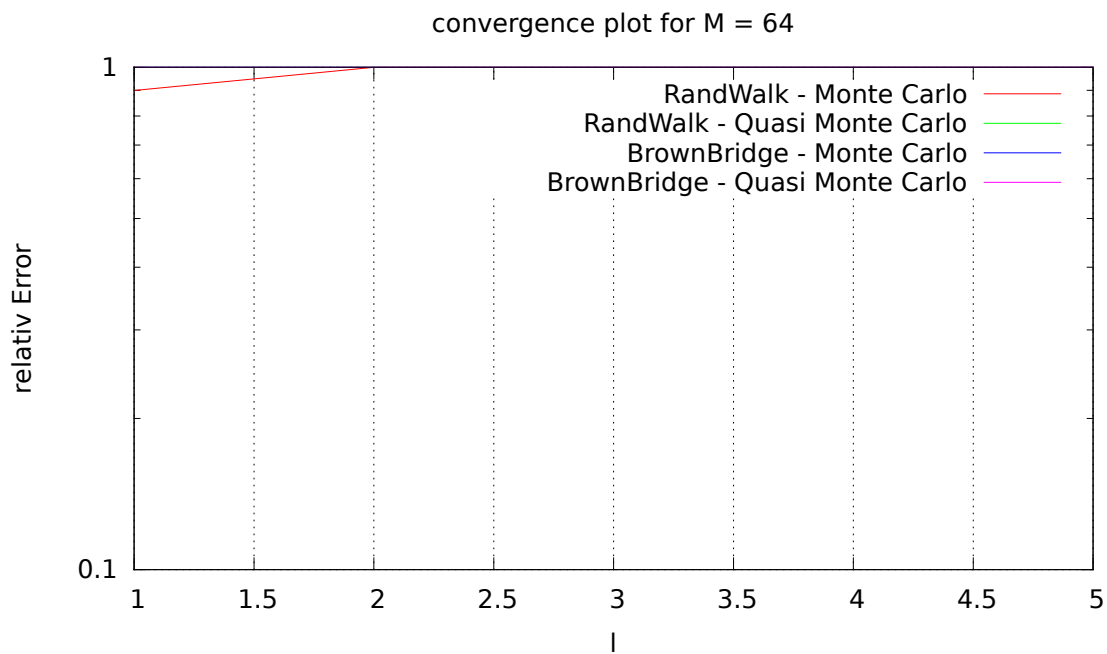
Task: 18

Because of the impact of the dimension into the convergence rate, the product rule should be used for low dimensions, the sparse grid can be used for higher dimensions, then quasi Monte Carlo and for any high dimension the Monte Carlo integration method whichs convergence rate does not depend on the dimension.