Project 2

MGMTMFE 405

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Question 1.

Seed1 = 1424
P(Y>5) is 0.9788

Seed2 = 1234
E1 is 0.636894

Seed3 = 23536
E2 is 25.6705

Seed4 = 25362
E3 is 14.4179

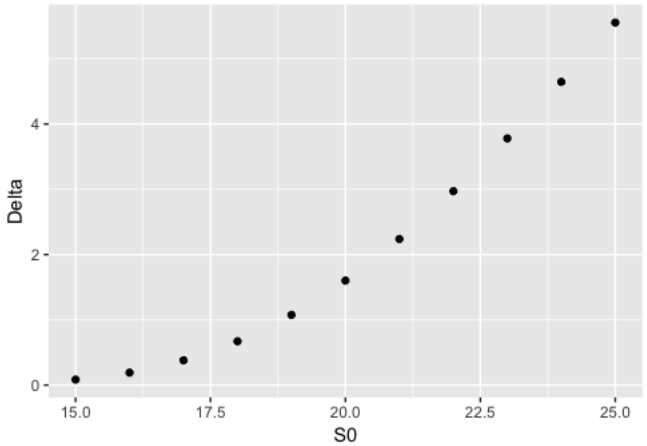
Question 2.

Seed = 41356
Q2. E1 is 1.33894
Q2. E2 is 1.32586

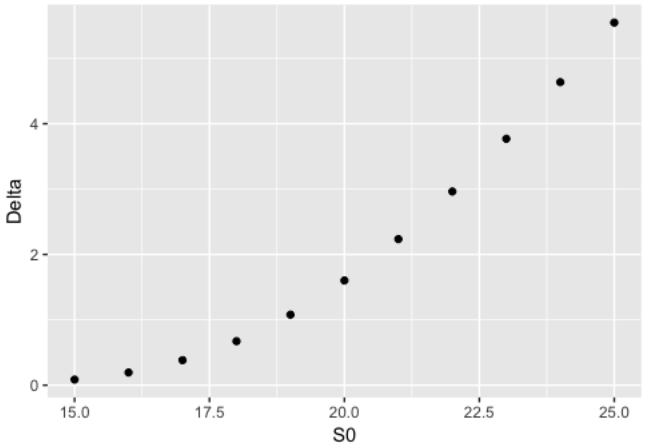
By solving the geometric distribution Xt, we found that the Xt and Yt are similar distributions. Therefore, we have similar result for these two distributions.

Question 3.

(a) Call option pricing from Monte Carlo Method:



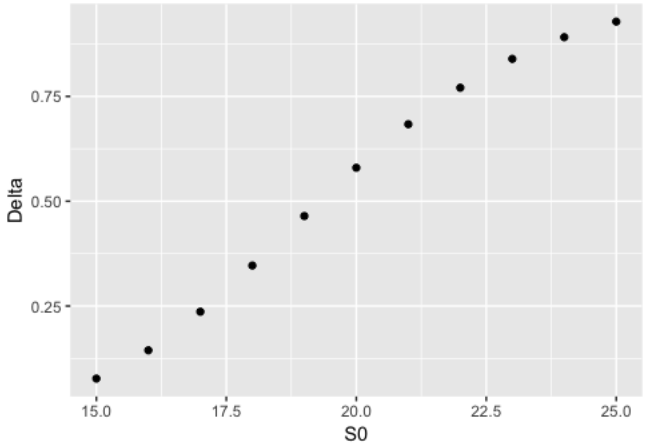
(b) Call option pricing from solving Black schole:



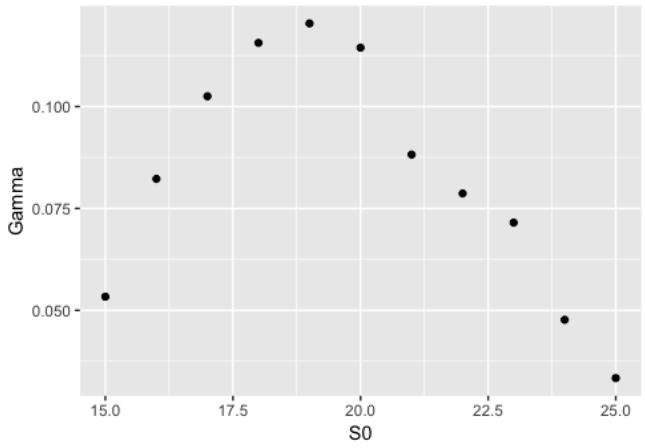
Both Monte Carlo methods and Black schole equations give similar result of the call option pricing.

(c)

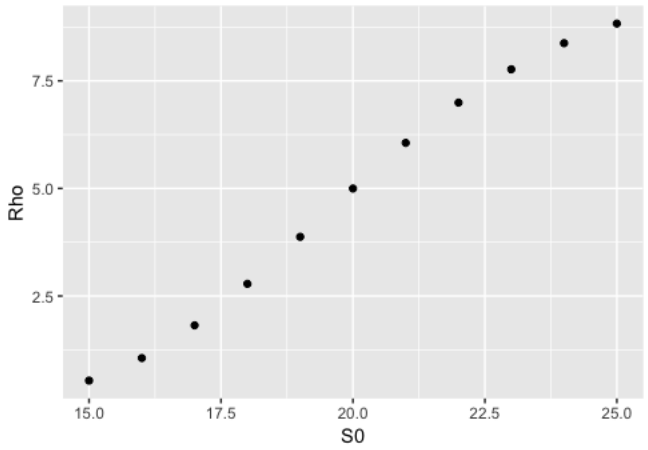
Delta:



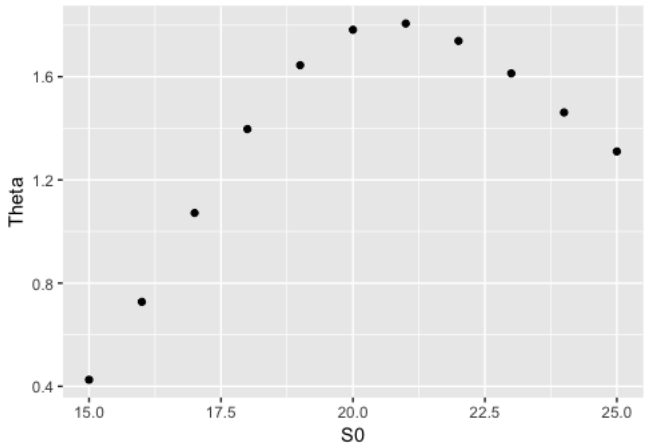
Gamma:



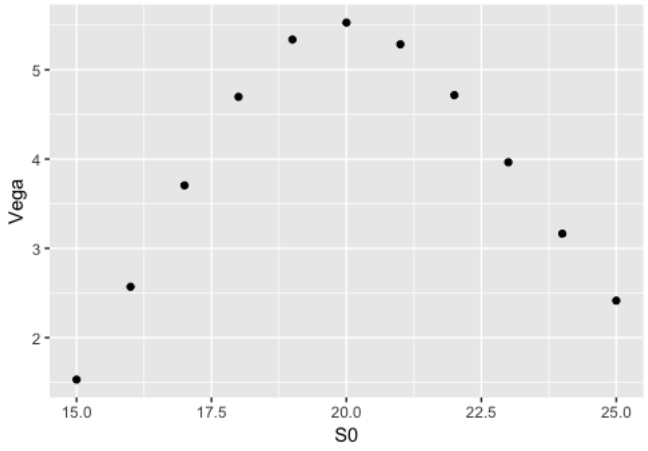
Rho:



Theta:



Vega:



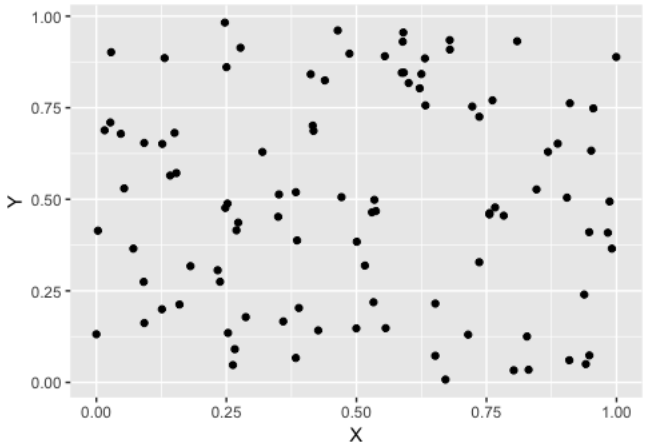
Question 4.

Reflection: 2.64221
Partial truncation: 2.63973
Full truncation: 2.64085

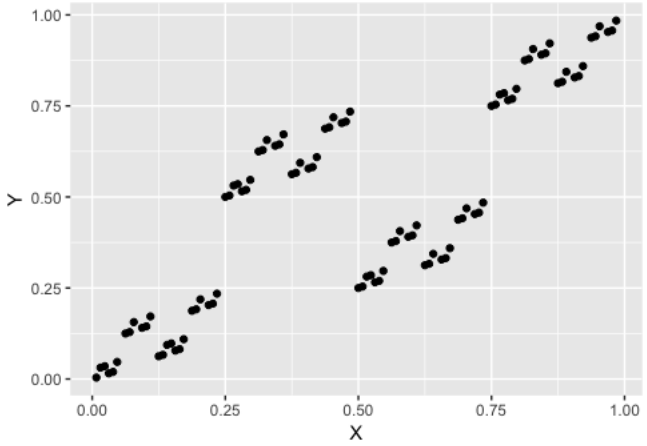
In the short time simulation, we did not observe even where the volatility hit the negative value. Unfortunately, none of the simulation were

Question 5.

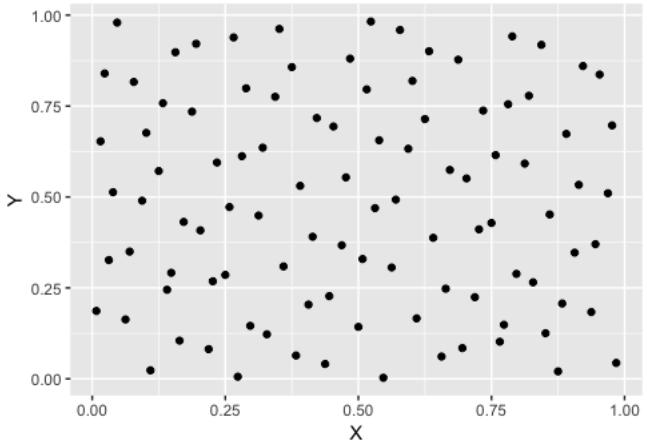
Monte Carlo simulation:



Quasi Monte Carlo number of base 2 and base 4:



Quasi Monte Carlo number of base 2 and base 7:



Q5.c1 if we choose base 2,4: -0.0048839
Q5.c2 if we choose base 2,7: 0.0261144
Q5.c3 if we choose base 5,7: 0.0261637