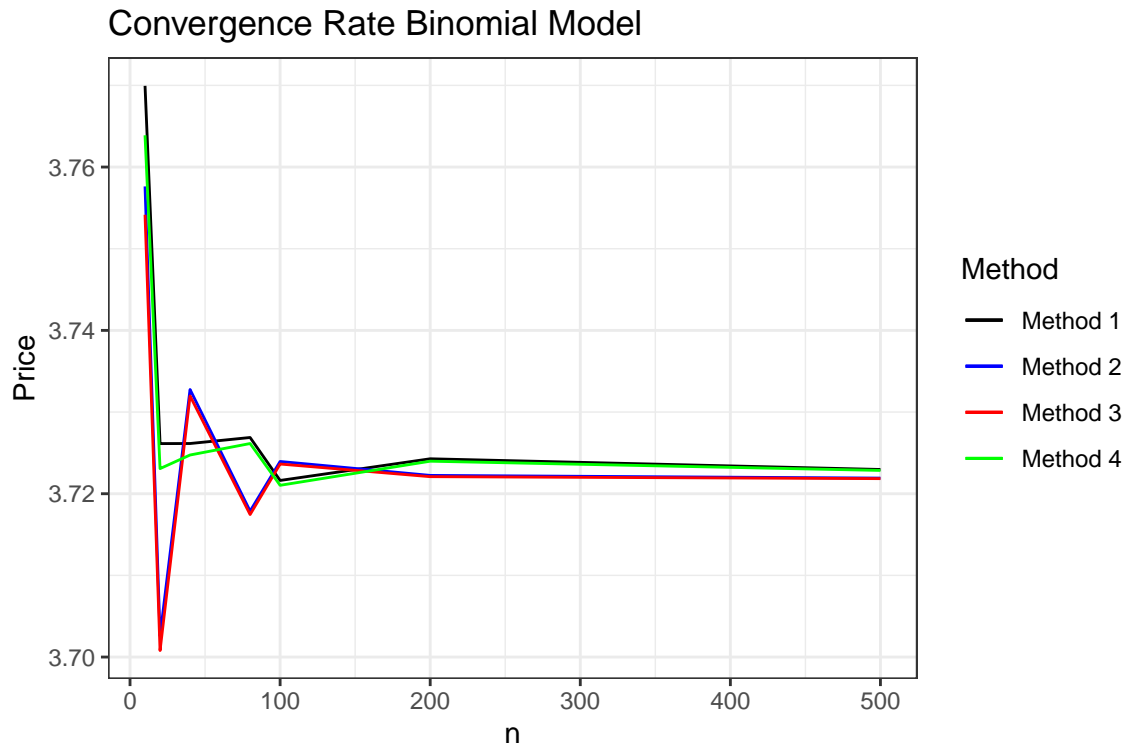# CF_Project_4

Question 1.

Using the different methods, the convergence rates of the different methods are shown in the plot below:

I will be using Method 4 and n = 500, in the next sections below whenever the binomial method is called to evaluate the option price.

Question 2. AMZN Price

(a.) The current stock closing price for AMZN (04/28/2020) is 2314.08, with k = 2540, annualized volatility of 28.78%, $r = 2\%$, and t = 0.7342. The call price is:
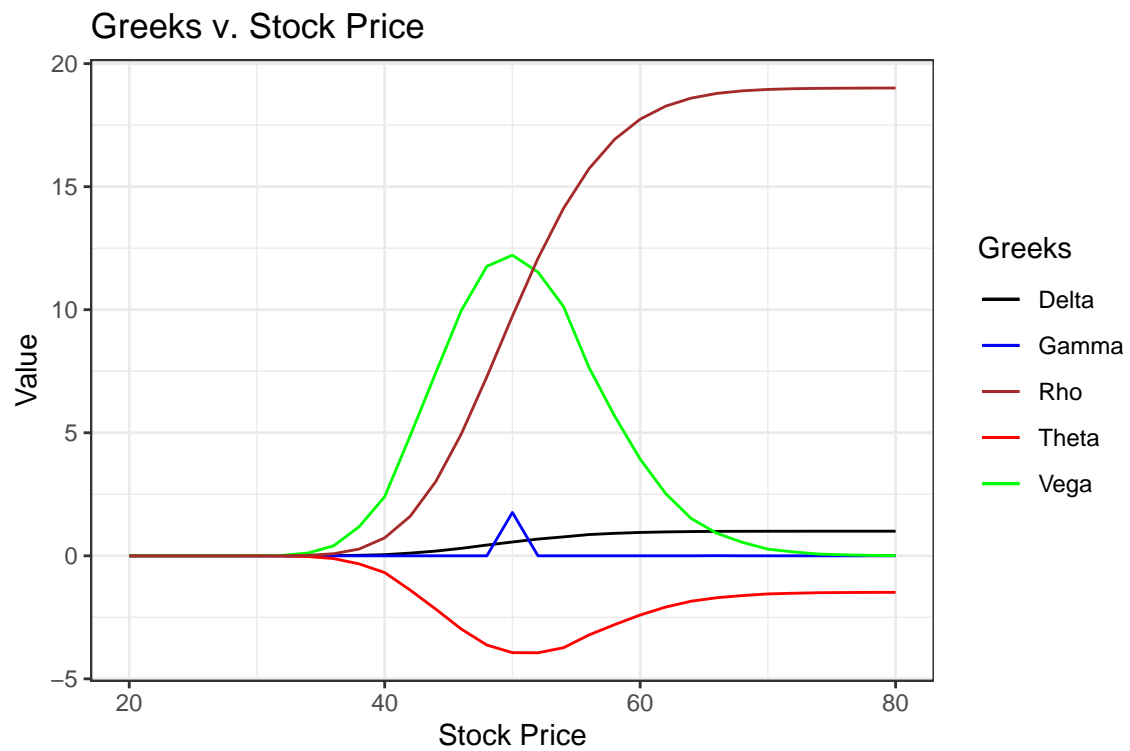
```
## [1] 153.7407
```

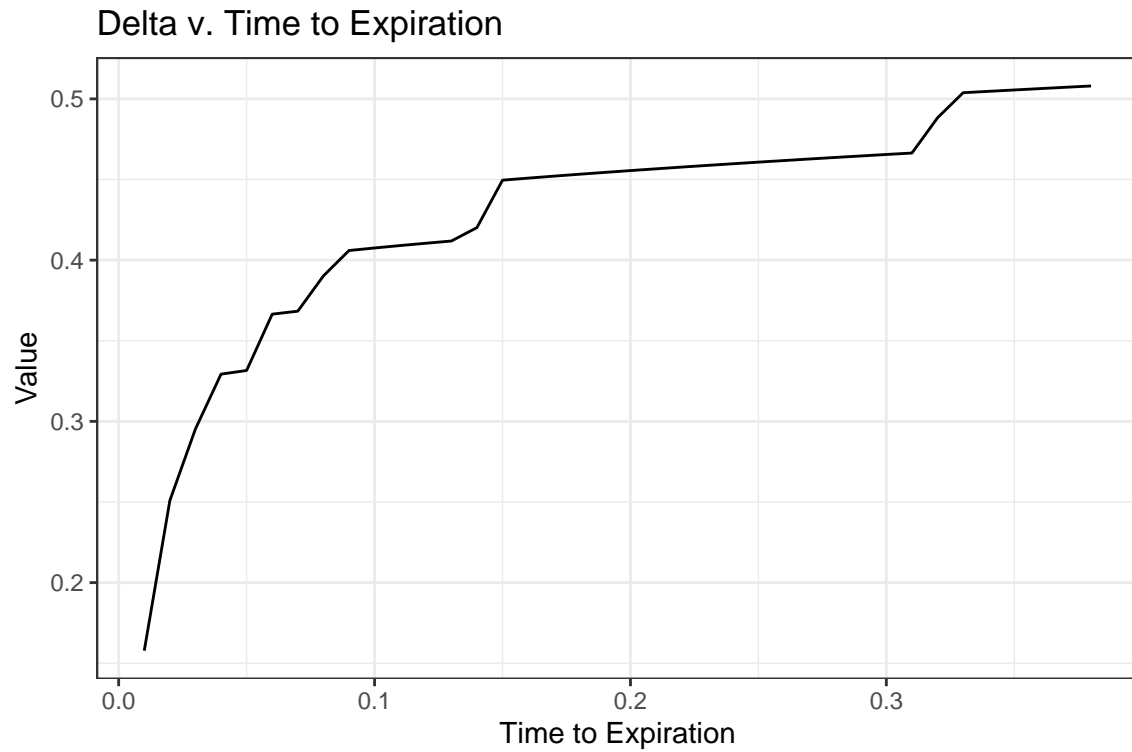(b.) The actual call price is 344.5, using this number the implied volatility is:

```
## [1] 0.5298112
```

Question 3.

Using the parameters given, the greeks of the call option as we vary the spot price is shown by the plot below:
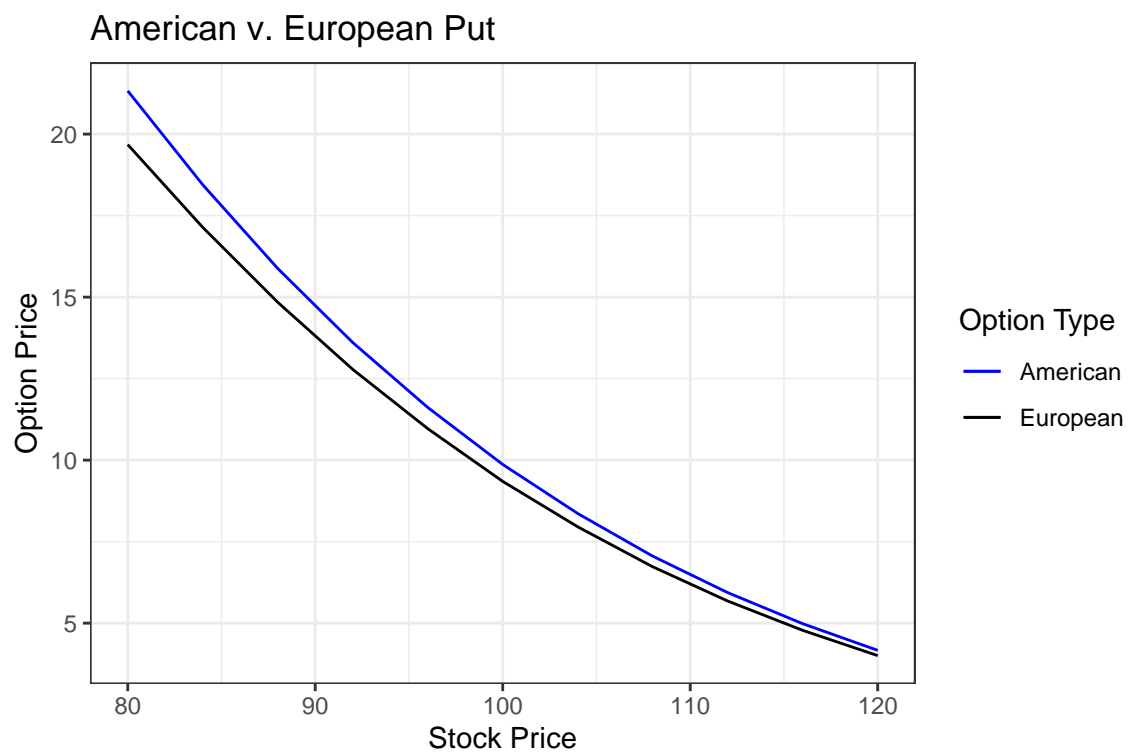

The Delta of the call option as time to expiration changes is shown below:

Delta v. Time to Expiration

Question 4.

The plot of the American and European put for different stock prices is shown below:

American v. European Put

The value of the American put is always slightly above the value of the European put.

Question 5.

The convergence rate of the two different trinomial methods can be seen in the plot below:
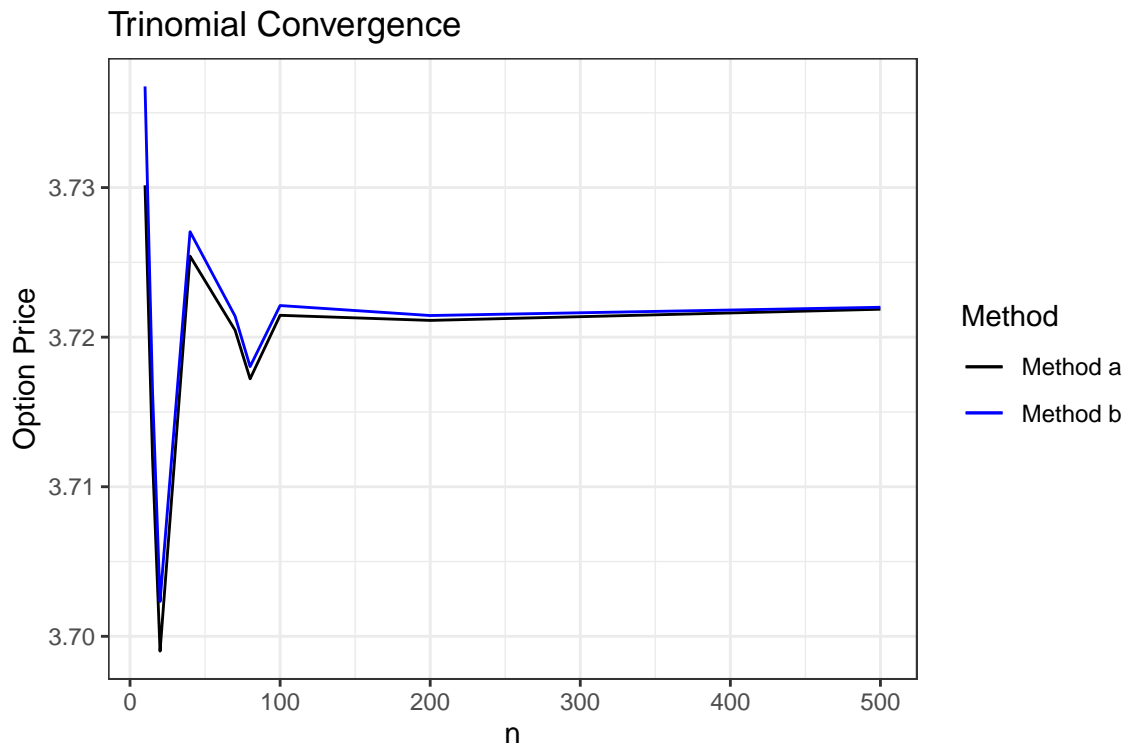
Question 6.

Using the following parameters $S_0 = 32$, $K = 30$, $r = 0.05$, $t = 0.5$, $\sigma = 0.24$, the Call Option price found using the Halton's sequence with $N = 10,000$ and $b_1 = 3$ and $b_2 = 5$ is

```
## [1] 3.723628
```