

Understanding Viral Contagion Using SIR Model

Modelled using Excel and Mathematica

Explored Differential Equations, Taylor Series and Euler's Method

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Introduction:

Since March of 2020, our small country Bangladesh was devastated with a pandemic. It was perplexing to us since we have never encountered such an occurrence. However, through my knowledge of history, I knew nothing ever happens once; I decided to search the occurrence of these pandemics, endemics, epidemics, and numerous other terms that describe the phenomenon of viral contagion – which is a given population rapidly infected with a virus. Being a higher-level math student, mathematics fascinates me; I often tend to find a mathematical approach to viewing things, and this applies across numerous domains; hence, I set out to find a mathematical approach to viewing virality. After my preliminary research I found numerous types of virus which go viral, to keep it within the scope of this investigation I will focus on respiratory viruses, the reason being is because respiratory virus tends to spread faster and usually are the ones to evolve to a pandemic, whereas virus spread by touch tends to spread slower.

Many internet personalities have mentioned flattening the curve, even my favorite YouTubers have talked greatly about it. Almost all of them have referred to this curve based on the SIR model, which piqued my curiosity because the nature of the curve was quite strange; usually, a single distinct curve is illustrated to demonstrate the effects of a virus, however, the SIR model employed three separate curves that were related to each other and were plotted in a single graph. It was perplexing and intriguing simultaneously, which is why I have attempted to investigate the SIR model and examines its validity in pandemics.

Throughout history, there have been numerous pandemics many of them were much deadlier than the current one, however, when those pandemics occurred there was not sufficient data. Since we live in the digital age of information, data is readily available to us. The novel coronavirus COVID-

19 is the first global pandemic to have taken place in my lifetime, hence, I will use COVID-19 to analyze the SIR model because this virus has left a devastating impact on our country and family.

Introducing SIR Model:

The model was first established by Kermack and Mckendrick in the year 1927, further work has been done on the model later on to create numerous variations of the SIR model.¹ According to the definition of the SIR model, this is an “epidemiological model that computes the theoretical number of people infected with a contagious illness in a closed population over time.”² The model is rudimentary and often used for preliminary modeling of possible pandemics. It is also the most popularized and widely used model to describe a pandemic. Based on the nature of the virus – whether it has an incubation period, or can the virus infect an individual more than once, and other similar scenarios – a particular version of the SIR model use used. At the time of conducting this investigation, not much information on the nature of the virus is available on the internet, hence, the standard SIR model will be implemented. The investigation will use the following variables³:

N = Total Population

t = represents the time in days

S(t) = the number of susceptible individuals as a function of time

I(t) = the number of infected individuals as a function of time

R(t) = the number of recovered individuals as a function of time

dt = change in time

¹ “Compartmental Models in Epidemiology,” Wikipedia (Wikimedia Foundation, February 28, 2021), https://en.wikipedia.org/wiki/Compartmental_models_in_epidemiology.

² <https://mathworld.wolfram.com/SIRModel.html>

³ “The Sir Model for Spread of Disease - the Differential Equation Model,” accessed January 13, 2021, <https://www.maa.org/press/periodicals/loci/joma/the-sir-model-for-spread-of-disease-the-differential-equation-model>.

The model follows the following flow diagram:

$$S \rightarrow I \rightarrow R$$

Initially, everyone is considered in the Susceptible population, they eventually move from the susceptible category to the infected category and finally the removed category. It is important to note that the model regards the deceased and recuperated as the same.

The rate at which they change categories⁴:

$$S' = -\beta SI$$

$$I' = +\beta SI - VI$$

$$R' = +VI$$

To elaborate on the equations above, β is a constant for the transmission rate which when multiplied with the number of interactions between S and I – the number of interactions between the susceptible and infected population is represented by SI – gives the rate at which the susceptible population is getting infected. The negative $-\beta SI$ represents the rate at which the population declines from the susceptible category. Therefore, the equation to describe the change in susceptible population is given by $S' = -\beta SI$. Additionally, the rate at which the susceptible category loses individuals is also the rate at which the infected category gains people, hence $+\beta SI$. Furthermore, the infected category also loses individuals as they eventually recover; this is given by multiplying the recovery constant, V , with the infected population, I , to give the rate at which the population recovers leading to $-VI$. Thus, the equation to describe both the rate at which the infected category gains and loses individuals is given by $I' = +\beta SI - VI$. The final category the

⁴ “The Sir Model for Spread of Disease - the Differential Equation Model,” accessed January 13, 2021, <https://www.maa.org/press/periodicals/loci/joma/the-sir-model-for-spread-of-disease-the-differential-equation-model>.

population enters is the removed category regardless of whether they die or recover; similarly, this category gains the population at the same rate at which the infected category loses the population, hence $+VI$. Therefore, the equation for the removed category is given by $R' = +VI$.

Therefore, the following flow diagram represents the change in categories:

$$S \xrightarrow{\beta SI} I \xrightarrow{VI} R$$

The assumptions the SIR model considers:

1. Every individual may interact with one another – which in some cases is referred to as homogenous mixing – which is represented by multiplying the susceptible population with the infected population:

$$SI$$

2. The population is regarded as constant because pandemics are a burst of viral contagion of a virus that lasts for a very short time in comparison to the human population which grows at a much slower rate. Furthermore, the model assumes there is no change in net migration, no change in tourists due to travel seasons, or any activity that may result in a spike or fall in population. Therefore, the net population change can be represented by⁵:

$$(S + I + R)' = S' + I' + R' = -\beta SI + \beta SI - VI + VI = 0$$

where zero refers to no change in the population.

3. No latency/incubation period is considered for this model. It is assumed the virus is active and working as soon as a susceptible individual interacts with an infected individual.

⁵ “The Sir Model for Spread of Disease - the Differential Equation Model,” accessed January 13, 2021, <https://www.maa.org/press/periodicals/loci/joma/the-sir-model-for-spread-of-disease-the-differential-equation-model>.

COVID-19:

The novel coronavirus COVID-19 is a respiratory virus that spreads through “respiratory droplets and aerosol”; which means when an infected individual coughs or sneezes, the water droplets containing the virus propels through the air across the room to infect another individual.⁶ Respiratory droplets which is a key trait of respiratory diseases; such diseases tend to spread rapidly as the infected individual is unaware of their ailments⁷. The model does not consider the severity of the illness, but rather if they are infected or not. At the time of this investigation not much is known about the novel coronavirus, information such as prevention or the incubation period or not known, furthermore, the coronavirus disease 2019 is assumed to infect an individual a single time, which means an individual from the removed category cannot be infected again. Hence, the SIR model will be applicable for this virus. Additionally, the investigation aims to model viral contagion, SIR model has been chosen preferably but the investigation should not suggest that this model should be given preference over any other. Moreover, this investigation is a mathematical approach and so it does not emphasize the underlying biology behind these viruses. COVID-19 has had a global outspread; but, I intend to focus on my country Bangladesh.

To model the virus, two key pieces of information would be needed, which are:

The rate at which the population was infected, often referred to as the transmission rate (β)⁸:

$$\beta = 0.187$$

⁶ “Basic Reproduction Number,” Wikipedia (Wikimedia Foundation, February 16, 2021), https://en.wikipedia.org/wiki/Basic_reproduction_number.

⁷ “Basic Reproduction Number,” Wikipedia (Wikimedia Foundation, February 16, 2021), https://en.wikipedia.org/wiki/Basic_reproduction_number.

⁸ Raguib Hassan et al., “Prediction of Epidemics Trend of COVID-19 in Bangladesh,” Frontiers (Frontiers, September 15, 2020), <https://www.frontiersin.org/articles/10.3389/fpubh.2020.559437/full>.

Along with the rate at which the population enters the removed category, referred to as the recovery rate (V)⁹:

$$V = 0.006$$

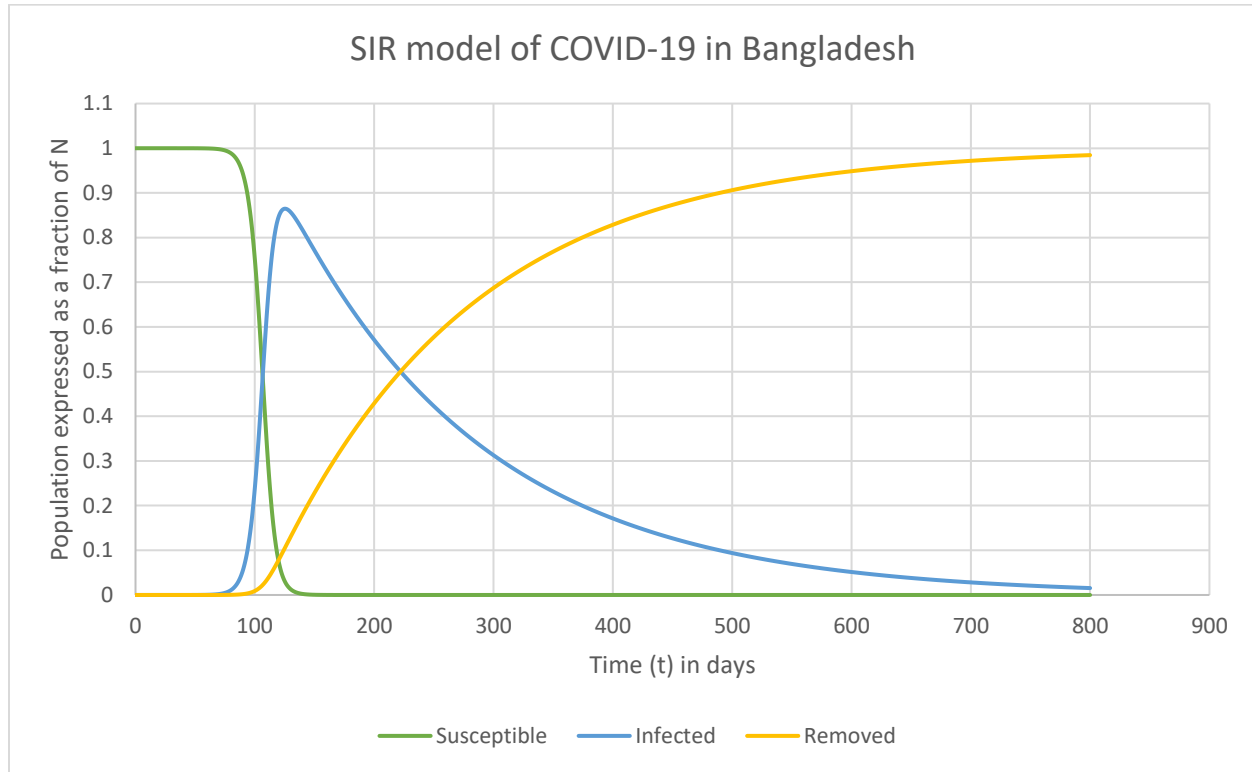


Figure 1: The model was created using Microsoft Excel 2019

Figure 1 illustrates the SIR model for Bangladesh when the appropriate equations and data were plotted for the equations (S' , I' , R'), the table can be found in the appendix. The pandemic has been around for several months now, so it was wise to take an appropriate timeline to demonstrate the entire model; as such, I have selected 800 days for the model to compute. The figure resembles a typical SIR model graph, however, when observed carefully there are few distinct features to this graph. First of all, the timeline for this pandemic – from its inception to its end – is unusually long. The second point to notice is the infected curve does not peak at 1 on the vertical axis, which is

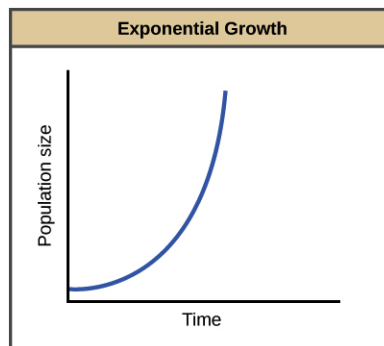
⁹ Raguib Hassan et al., “Prediction of Epidemics Trend of COVID-19 in Bangladesh,” Frontiers (Frontiers, September 15, 2020), <https://www.frontiersin.org/articles/10.3389/fpubh.2020.559437/full>.

the population expressed as a fraction of the total population, which suggests some prevention procedures have been taken by the country. Around the 100th day the infected curve spikes while the susceptible curve plummets; this suggests there is an inverse relationship between the two curves until the 120th day. Both curves intersect at around 0.5 – half the population was still in the susceptible category while the other half was infected. Since during the initial phases of the novel coronavirus, there were no vaccines or treatment available the only possible deduction that can be made of the removed curve is that the individuals entering the removed category have deceased from the illness. Around the 140th day the infected curve peaks and start to decrease at a decreasing rate, while the removed curve starts to increase at a decreasing rate. At this point the susceptible population has reached near zero which suggests everyone in the country has the disease by the 140th day, however, real-time data suggests the contrary. In fact, out of the 164 million people in the country, not even a million have had COVID-19; although this could be blamed on the lack of testing. Coincidentally, around the 220th day, the infected and removed curve intersect at 0.5 and continue in their trajectory in a manner that if u were to draw a line from point 0.5 you would notice that from day 220th and onwards the infected and removed curve mirror each other. This would suggest there is an inverse relationship between the infected and removed from day 220th and onwards.

It is important to note that these curves may appear to be exponential, however, they are not necessarily. Judging by the S-shaped nature of the removed curve, it can be assumed it is a logistic curve.

Exponential & Logistic Growth:

Exponential: The population's per individual growth rate remains the same regardless of the population size, hence, the bigger the population gets the faster it grows.¹⁰ They tend to be J-shaped curves.¹¹



Exponential Growth Curve Adapted from Khan Academy¹²

Logistic Growth: The population's per individual growth reduces as population size approaches its maximum limit; the maximum limit is also referred to as the carrying capacity.¹³ They tend to be S-shaped curves.¹⁴

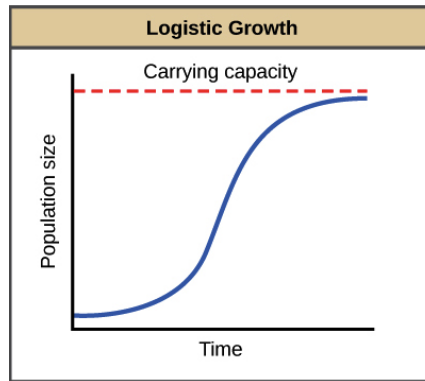
¹⁰ "Exponential Growth & Logistic Growth (Article)," Khan Academy (Khan Academy), accessed March 4, 2021, <https://www.khanacademy.org/science/ap-biology/ecology-ap/population-ecology-ap/a/exponential-logistic-growth>.

¹¹ "Exponential Growth & Logistic Growth (Article),"

¹² "Exponential Growth & Logistic Growth (Article),"

¹³ "Exponential Growth & Logistic Growth (Article)," Khan Academy (Khan Academy), accessed March 4, 2021, <https://www.khanacademy.org/science/ap-biology/ecology-ap/population-ecology-ap/a/exponential-logistic-growth>.

¹⁴ "Exponential Growth & Logistic Growth (Article),"



Logistic Growth Curve Adapted from Khan Academy¹⁵

Based on the images provided, it can be assumed the removed curve reaches its carrying capacity of 1 (total population) as the limiting factor is that there can be no more recovered individuals above the total population. Therefore, we see a S-shaped curve for the removed curve. Furthermore, since initially we have been provided with the rate of change of the curve, it can be assumed that the function for this removed curve could be a logistic growth function. Although, the removed curve does not entirely appear S-shaped, so it makes it difficult for us to determine its equation.

In an attempt to compress the graph, I tried to increase the increment value of the time (t) in the graph from 1 – which I used for Figure 1 – to 20; this would mean instead of the graph plotting the curves for day 0, 1, 2, 3, 4 it would plot for 0, 20, 40, 60 and so on. The results were perplexing yet fascinating as shown in Figure 2.

¹⁵ “Exponential Growth & Logistic Growth (Article),”

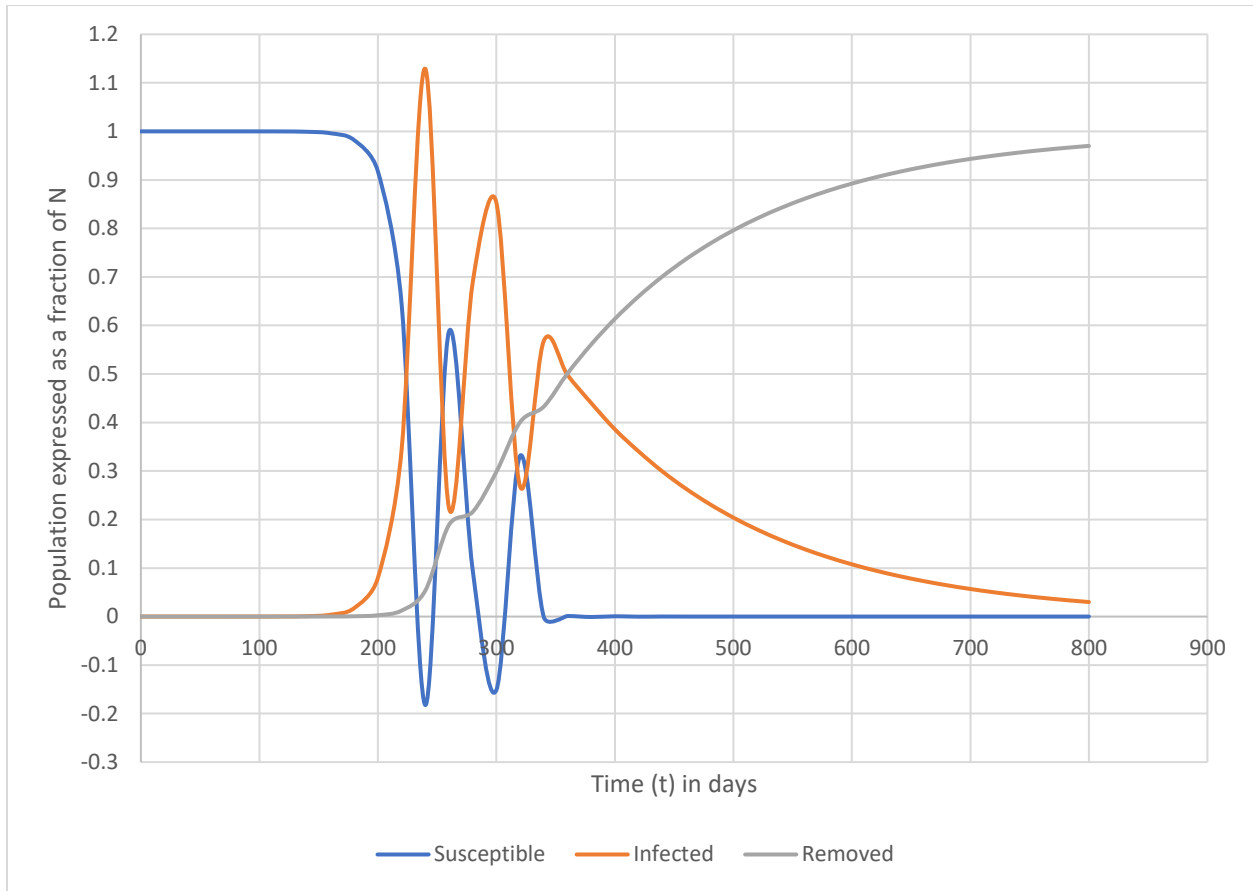


Figure 2: The SIR model of Bangladesh using t increment value of 20

All other data was the same for this model, the only change made was to the t increment value. This is an abnormal phenomenon that is not present in other SIR models. To explain this phenomenon, I had to look into the equations inserted in Excel and observe any anomalies. I noticed I approached this modeling in an iterative method similar to approaches I have for programming. Since I utilized my computer science knowledge to model this virus, I inadvertently utilized a mathematical approach to linearize the differential equations, one that was established by a prolific mathematician, which was Euler's Method.

Euler's Method:

Named after renowned mathematician Leonhard Euler, Euler's method is an approach to solve differential equations that otherwise could not be solved using traditional methods. The approach employs the idea of "local linearity or linear approximation" where we utilize "tangent lines to approximate the solution of an initial-value problem".¹⁶ Euler's Method is often applied using computers to deal with complex problems, large amounts of data, and numerous equations simultaneously; as such, the approximations significantly speed up the computing time. The following diagram shows Euler's Method being implemented; a tangent is drawn at a point, it is extrapolated to find another point on the curve, using the new points a new tangent is drawn to find another point on the curve, this process is continued until we arrive at an approximation of the desired solution.

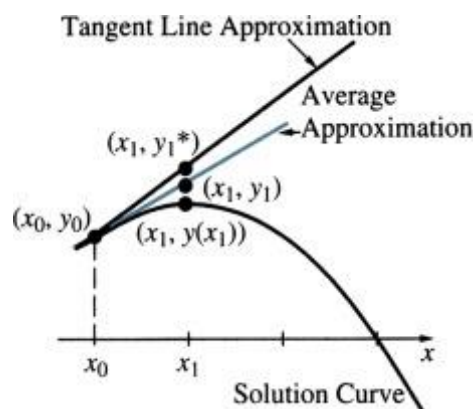


Figure 3: A diagram demonstrating how Euler's Method is implemented¹⁷

¹⁶ "How to Do Euler's Method? (Simply Explained in 4 Powerful Examples)," Calcworkshop, December 31, 2019, [https://calcworkshop.com/first-order-differential-equations/eulers-method-table/#:~:text=Euler%27s%20Method%2C%20is%20just%20another,to%20an%20initial-value%20problem.&text=We%20will%20begin%20by%20learning%20Euler%27s%20Method%20Formula](https://calcworkshop.com/first-order-differential-equations/eulers-method-table/#:~:text=Euler%27s%20Method%2C%20is%20just%20another,to%20an%20initial-value%20problem.&text=We%20will%20begin%20by%20learning%20Euler%27s%20Method%20Formula.).

¹⁷ "Euler Method," Euler Method - an overview | ScienceDirect Topics, accessed March 5, 2021, <https://www.sciencedirect.com/topics/computer-science/euler-method>.

The reason to use Euler's Method is we were provided an initial value – for our case (S_0, I_0, R_0) – and the slope of the curve; the function of the curve is not known to us, so we cannot plot the points which is why we resort to approximating the shape of the curve according to the step size formed with the tangents.

Furthermore, Euler's Method makes the assumption the solution can be written in the form of a Taylor Series.¹⁸ Fortunately, for Euler's Method approach to the SIR model, we will only need the first two terms, of that one of them is the initial values to the system of ordinary differential equations employed. The equations are written in the following form¹⁹:

$$S_{t+1} = S_t - (\beta S_t I_t) dt$$

$$I_{t+1} = I_t + (\beta S_t I_t - \nu I_t) dt$$

$$R_{t+1} = R_t + \nu I_t dt$$

Taylor Series:

Taylor Series is an expansion series of a given function about a point.²⁰ The partial sums of the series can be utilized to approximate the function.²¹ An example of a Taylor series is provided below²²:

$$f(x) = f(a) + f'(a)(x-a) + \frac{f''(a)}{2!}(x-a)^2 + \frac{f^{(3)}(a)}{3!}(x-a)^3 + \dots + \frac{f^{(n)}(a)}{n!}(x-a)^n + \dots$$

¹⁸ Murray Bourne, "11. Euler's Method - a Numerical Solution for Differential Equations," intmathcom RSS, accessed March 4, 2021, <https://www.intmath.com/differential-equations/11-eulers-method-des.php>.

¹⁹ Brian Sullivan, "SIR Model For Disease Spread- 3. Euler Integration in Spreadsheets," YouTube (YouTube, April 7, 2020), <https://www.youtube.com/watch?v=2Hsl1C1ov5c>.

²⁰ "Taylor Series," from Wolfram MathWorld, accessed March 4, 2021, <https://mathworld.wolfram.com/TaylorSeries.html>.

²¹ "Taylor Series," Wikipedia (Wikimedia Foundation, March 2, 2021), https://en.wikipedia.org/wiki/Taylor_series.

²² "Taylor Series," from Wolfram MathWorld, accessed March 4, 2021, <https://mathworld.wolfram.com/TaylorSeries.html>.

Taylor polynomials allow us to use the derivative information at a point to obtain the information of a nearby point. In the Excel spreadsheet we have utilized an iterative approach to model the virus, which means we utilized the Taylor Series for our system of ordinary differential equations in the following form, as outlined in the table:

Time in Days	Susceptible (S_t)	Infected (I_t)	Removed (R_t)
t=0	$S_0 = 1$	$I_0 = 1.82927E - 08$	$R_0 = 0$
t=1	$S_1 = S_0 - (0.187 * S_0$ $* I_0) * 1$	$I_1 = I_0 + (0.187 * S_0 * I_0$ $- 0.06 * I_0)$ $* 1$	$R_1 = R_0 - (0.06 * I_0)$ $* 1$
...
t=n	$S_n = S_{n-1} - (0.187 * S_{n-1}$ $* I_{n-1}) * dt$	$I_n = I_{n-1} + (0.187 * S_{n-1}$ $* I_{n-1}$ $- 0.06$ $* I_{n-1}) * dt$	$R_n = R_{n-1} - (0.06$ $* I_{n-1})$ $* dt$

Returning to Figure 2, the curves have a sinusoidal shape whereas the curves in Figure 1 resembled the shape of logistic curves. Despite the oddities, the curves have maintained few similarities with Figure 1 where the S' and I' curves and I' and R' curves intersect at point 0.5. However, there are more intersection among the S' and I' curves this time, as shown in the graph above. Furthermore, the S' the curve also dips to the negative vertical axis three times, and quickly sprouts back; the shape of the curve appears analogous to the shape of a curve that models the behavior of a bouncing

ball. We already explained how Euler's Method works, therefore the explanation to these anomalies would be simple. For Figure 1, the increment value for t was set to 1, so for each day passed 0, 1, 2, 3, 4 there would be a corresponding value for the S' , I' , and R' curve; additionally, the tangents drawn using one point to approximate the next point on the curve would be smaller. Smaller the tangents, the smaller the step size of the curves, which would mean more points of the curve were calculated; the greater number of points have resulted in better accuracy of the direction to draw the tangents. Hence, the result was a better-shaped curve that had approximated the solution much closer to the actual one; which means a smaller error percentage. While for Figure 2, t increment value was 20, it resulted in longer tangents and bigger approximations to be made, along with fewer data points as we now had days in 0, 20, 40, 60, resulting the shape in Figure 2. Furthermore, this would also suggest if t were assigned a smaller value than 1 then it would have created a better curve, although, since t is in days, anything less than 1 would mean it would be calculated in hours. It is important to know that most pandemics aren't measured in hours as such a catastrophic disease is very rare; there have been only a few recorded diseases in history where there has been a noticeable change in population categories in hours. Black Plague is one such disease, however, since it was not a respiratory disease but rather a bubonic plague, it has been left us of this investigation. The result of setting $t = 0.5$ is illustrated in Figure 4.

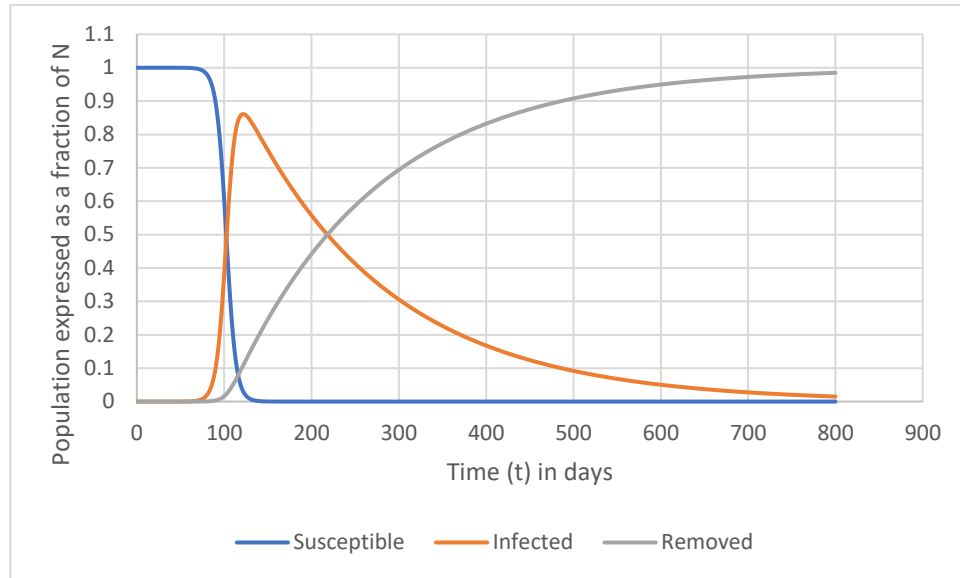


Figure 4: t increment value set to 0.5

The graph above shows there isn't any noticeable difference in setting t increment value to 0.5; in fact, it appears analogous to Figure 1 with a t increment value of 1. Setting t increment value to 0.5 would only make analyzing the graph and data much more difficult. If we set the increment value of t to 10, it would result in a much better approximation, as shown in Figure 5.

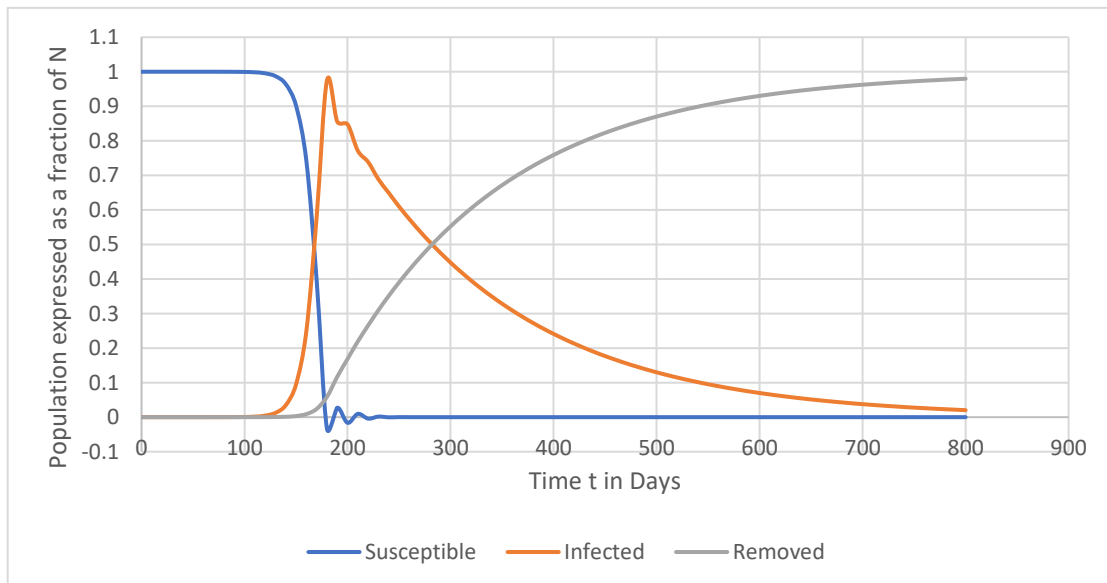


Figure 5: t increment value set to 10

Interestingly, the difference between setting t increment value to 10 and 20 is shocking. Figure 5 has only a few dips in the negative axis and few areas where the curve goes up and down, otherwise, it does not have the numerous intersections of curves as Figure 2 did and appears similar to Figure 1.

Further Application:

The SIR model is primarily implemented in the field of epidemiology; usually for viruses that can infect a person a single time. It is used to understand the overall effect of a virus on a population and how to curb its effects through vaccination, prevention, and other safety precautions. The model can certainly be implemented for other pandemics; however, the nature of the virus needs to be considered because this rudimentary SIR model utilizes three ordinary differential equations and can only provide an overall picture of the whole pandemic. Epidemiological viruses behave in a similar way to computer viruses, it would be interesting to see further research being done on this model where its implementation is stretched beyond the field of epidemiology. Although computer viruses usually do not become pandemics (that they infect large numbers of computers) because of effective anti-viruses and security protocols implemented that would deal with the virus before they spread too much. The model should not be limited to only viruses, but rather could possibly be applicable for anything that becomes viral; for example, the model could be applied to memes or the stock market as well.

Conclusion:

The SIR model is a widely used epidemiological model and is often the primary model employed to understand the impact of a virus. As such, it is important to understand this model is applicable

only for certain types of diseases that would go viral rapidly, because if the time taken for the virus to spread is too long, let's say 10 days, then the model will draw longer tangents which may result in an inaccurate approximation. Therefore, such models are usually applicable for disease such as the coronavirus disease 2019 because it spreads rapidly. Furthermore, assumptions such as homogenous mixture make it difficult to track the virus as it assumes everyone interacts with everyone else which is not the case in the real world; some people spread the virus more than others. It also does not take into account the virus density in an individual which could cause some to spread more than others. Additionally, it is difficult to measure the virus population, hence the model should serve as an estimation and not be regarded as concrete facts. The time t increment value must be set according to the virus's transmission rate; if it is spreading daily setting the time increment to weekly would lead to poor approximations or setting the increment to hourly would lead to unnecessarily large amounts of data that is difficult to analyze, similar to the scenarios mentioned above.

After this analysis of COVID-19 and as we are updated with new information from the news daily, the SIR model does not properly illustrate this virus because this is a dynamic virus, which means at certain seasons it spreads more and a person can also get this disease more than once. Therefore, the SIRS model wouldn't have been ideal for such a disease, and a more dynamic approach to model the disease was needed. As the news has mentioned, the transmission and recovery rate has fluctuated over a year; this would mean the SIR model has not done a desirable job in portraying the virus. Furthermore, this model does not include the possibility of an incubation period, which could have been necessary for this disease. The model had predicted that after 100 days 80% of the population would be infected in our country, however, the infected population has not reached such great heights in our country, fortunately. Conversely, our country does not have sufficient

testing facilities, so it is difficult and arduous to examine the accuracy of this model for our country. Through this investigation, I was able to explore this epidemiological model across various mathematic fields: differential equations, Euler's Method, Taylor Series, logistic and exponential growth. Nevertheless, I fulfilled my yearning to understand the magnitude of COVID-19 in our country, and simultaneously pursued my interest in learning about viruses and their mathematical relationship.

Bibliography:

“Basic Reproduction Number.” Wikipedia. Wikimedia Foundation, February 16, 2021.

https://en.wikipedia.org/wiki/Basic_reproduction_number.

“Compartmental Models in Epidemiology.” Wikipedia. Wikimedia Foundation, February 28,

2021. https://en.wikipedia.org/wiki/Compartmental_models_in_epidemiology.

“Euler Method.” Euler Method - an overview | ScienceDirect Topics. Accessed March 5, 2021.

<https://www.sciencedirect.com/topics/computer-science/euler-method>.

“Euler's Method | Differential Equations (Video).” Khan Academy. Khan Academy. Accessed

March 4, 2021. <https://www.khanacademy.org/math/ap-calculus-bc/bc-differential-equations-new/bc-7-5/v/eulers-method>.

“Exponential Growth & Logistic Growth (Article).” Khan Academy. Khan Academy. Accessed

March 4, 2021. <https://www.khanacademy.org/science/ap-biology/ecology-ap/population-ecology-ap/a/exponential-logistic-growth>.

“How to Do Euler's Method? (Simply Explained in 4 Powerful Examples).” Calcworkshop,

December 31, 2019. [https://calcworkshop.com/first-order-differential-equations/eulers-method-](https://calcworkshop.com/first-order-differential-equations/eulers-method-table/#:~:text=Euler%27s%20Method%2C%20is%20just%20another,to%20an%20initial)

[table/#:~:text=Euler%27s%20Method%2C%20is%20just%20another,to%20an%20initial](https://calcworkshop.com/first-order-differential-equations/eulers-method-table/#:~:text=Euler%27s%20Method%2C%20is%20just%20another,to%20an%20initial)

[-value%20problem.&text=We%20will%20begin%20by%20learning%20Euler%27s%20Method%20Formula](https://calcworkshop.com/first-order-differential-equations/eulers-method-table/#:~:text=Euler%27s%20Method%2C%20is%20just%20another,to%20an%20initial).

“Susceptible Infection Recover SIR Model Using Google Sheet | Prediction of Infection Disease.”

YouTube. YouTube, April 8, 2020.

<https://www.youtube.com/watch?v=JqfJ1DXlOI0&t=328s>.

“Taylor Series.” from Wolfram MathWorld. Accessed March 4, 2021.

<https://mathworld.wolfram.com/TaylorSeries.html>.

“Taylor Series.” Wikipedia. Wikimedia Foundation, March 2, 2021.

https://en.wikipedia.org/wiki/Taylor_series.

“The Sir Model for Spread of Disease - the Differential Equation Model.” Accessed January 13,

2021. [https://www.maa.org/press/periodicals/loci/joma/the-sir-model-for-spread-of-](https://www.maa.org/press/periodicals/loci/joma/the-sir-model-for-spread-of-disease-the-differential-equation-model)

[disease-the-differential-equation-model](https://www.maa.org/press/periodicals/loci/joma/the-sir-model-for-spread-of-disease-the-differential-equation-model).

Bourne, Murray. “11. Euler's Method - a Numerical Solution for Differential Equations.”

intmathcom RSS. Accessed March 4, 2021. <https://www.intmath.com/differential-equations/11-eulers-method-des.php>.

Calcworkshop. “Euler's Method - A Simple Table That Works Every Time.” YouTube. YouTube,

February 14, 2016. https://www.youtube.com/watch?v=8cW_CQ77ayI.

Hassan, Raguib, Abu Sayem Dosar, Joytu Kumar Mondol, Tahmid Hassan Khan, Abdullah Al

Noman, Mirajus Salehin Sayem, Moinul Hasan, and Nasrin Sultana Juyena. “Prediction of Epidemics Trend of COVID-19 in Bangladesh.” *Frontiers*. Frontiers, September 15, 2020.

<https://www.frontiersin.org/articles/10.3389/fpubh.2020.559437/full>.

Sullivan, Brian. “SIR Model For Disease Spread- 3. Euler Integration in Spreadsheets.” YouTube.

YouTube, April 7, 2020. <https://www.youtube.com/watch?v=2Hsl1C1ov5c>.

Appendix:

$dt = 1$. t increment is 1

Time/Day	Susceptible	Infected	Removed
0	0.99999998	1.82927E-08	0
1	0.99999998	2.16037E-08	1.09756E-10
2	0.99999997	2.55139E-08	2.39378E-10
3	0.99999997	3.01319E-08	3.92462E-10
4	0.99999996	3.55858E-08	5.73253E-10
5	0.99999996	4.20269E-08	7.86768E-10
6	0.99999995	4.96337E-08	1.03893E-09
7	0.99999994	5.86174E-08	1.33673E-09
8	0.99999993	6.92272E-08	1.68844E-09
9	0.99999992	8.17573E-08	2.1038E-09
10	0.9999999	9.65554E-08	2.59434E-09
11	0.99999988	1.14032E-07	3.17368E-09
12	0.99999986	1.34672E-07	3.85787E-09
13	0.99999984	1.59047E-07	4.6659E-09
14	0.99999981	1.87835E-07	5.62018E-09
15	0.99999977	2.21833E-07	6.74719E-09
16	0.99999973	2.61985E-07	8.07818E-09
17	0.99999968	3.09404E-07	9.65009E-09
18	0.99999962	3.65406E-07	1.15065E-08
19	0.99999955	4.31544E-07	1.36989E-08
20	0.99999947	5.09654E-07	1.62882E-08
21	0.99999938	6.01901E-07	1.93461E-08
22	0.99999927	7.10845E-07	2.29575E-08
23	0.99999913	8.39508E-07	2.72226E-08
24	0.99999898	9.91459E-07	3.22597E-08
25	0.99999879	1.17091E-06	3.82084E-08
26	0.99999857	1.38285E-06	4.52339E-08
27	0.99999831	1.63314E-06	5.3531E-08
28	0.99999801	1.92874E-06	6.33298E-08
29	0.99999765	2.27784E-06	7.49023E-08
30	0.99999722	2.69013E-06	8.85693E-08
31	0.99999672	3.17704E-06	1.0471E-07
32	0.99999612	3.75208E-06	1.23772E-07
33	0.99999542	4.43121E-06	1.46285E-07
34	0.99999459	5.23325E-06	1.72872E-07
35	0.99999362	6.18047E-06	2.04272E-07
36	0.99999246	7.29913E-06	2.41354E-07
37	0.99999109	8.62026E-06	2.85149E-07
38	0.99998948	1.01805E-05	3.36871E-07

39	0.99998758	1.20232E-05	3.97954E-07
40	0.99998533	1.41993E-05	4.70093E-07
41	0.99998268	1.67694E-05	5.55289E-07
42	0.99997954	1.98046E-05	6.55905E-07
43	0.99997584	2.33891E-05	7.74732E-07
44	0.99997146	2.76224E-05	9.15067E-07
45	0.9999663	3.2622E-05	1.0808E-06
46	0.9999602	3.85263E-05	1.27653E-06
47	0.99995299	4.54993E-05	1.50769E-06
48	0.99994449	5.37343E-05	1.78069E-06
49	0.99993444	6.34596E-05	2.10309E-06
50	0.99992257	7.4945E-05	2.48385E-06
51	0.99990856	8.8509E-05	2.93352E-06
52	0.99989201	0.000104528	3.46457E-06
53	0.99987246	0.000123445	4.09174E-06
54	0.99984938	0.000145786	4.83241E-06
55	0.99982212	0.000172169	5.70712E-06
56	0.99978993	0.000203326	6.74014E-06
57	0.99975192	0.000240119	7.96009E-06
58	0.99970703	0.00028357	9.40081E-06
59	0.99965402	0.000334881	1.11022E-05
60	0.99959142	0.000395472	1.31115E-05
61	0.99951749	0.000467023	1.54843E-05
62	0.9994302	0.000551511	1.82865E-05
63	0.99932713	0.000651276	2.15955E-05
64	0.99920542	0.000769075	2.55032E-05
65	0.99906172	0.000908164	3.01177E-05
66	0.99889205	0.001072382	3.55666E-05
67	0.99869174	0.001266261	4.20009E-05
68	0.99845526	0.001495144	4.95985E-05
69	0.9981761	0.001765334	5.85694E-05
70	0.99784658	0.002084257	6.91614E-05
71	0.99745767	0.002460668	8.16669E-05
72	0.99699869	0.002904879	9.64309E-05
73	0.99645711	0.003429032	0.00011386
74	0.99581815	0.004047415	0.000134434
75	0.99506445	0.004776832	0.000158719
76	0.99417559	0.005637029	0.00018738
77	0.99312761	0.006651192	0.000221202
78	0.99189238	0.00784651	0.000261109
79	0.99043698	0.009254832	0.000308188
80	0.98872288	0.010913407	0.000363717
81	0.98670508	0.012865719	0.000429198

82	0.98433118	0.015162428	0.000506392
83	0.98154023	0.0178624	0.000597367
84	0.97826162	0.021033834	0.000704541
85	0.9744138	0.024755454	0.000830744
86	0.96990298	0.029117746	0.000979277
87	0.96462184	0.034224179	0.001153983
88	0.95844833	0.040192338	0.001359328
89	0.95124467	0.04715485	0.001600482
90	0.94285663	0.055259956	0.001883411
91	0.93311352	0.06467151	0.002214971
92	0.92182884	0.075568157	0.002603
93	0.90880225	0.088141338	0.003056409
94	0.89382298	0.102591759	0.003585257
95	0.87667529	0.119123898	0.004200808
96	0.85714633	0.137938122	0.004915551
97	0.83503673	0.159220093	0.00574318
98	0.81017421	0.183127287	0.0066985
99	0.78242996	0.209772779	0.007797264
100	0.75173718	0.239206921	0.009055901
101	0.7181107	0.271398158	0.010491142
102	0.68166554	0.306214932	0.012119531
103	0.64263187	0.343411305	0.013956821
104	0.6013634	0.382619316	0.016017289
105	0.55833596	0.423351038	0.018313005
106	0.51413437	0.465012516	0.020853111
107	0.46942662	0.506930198	0.023643186
108	0.42492688	0.548388358	0.026684767
109	0.38135121	0.588673694	0.029975097
110	0.33937131	0.627121548	0.033507139
111	0.29957265	0.663157479	0.037269869
112	0.26242251	0.696328673	0.041248814
113	0.22825157	0.726321645	0.045426786
114	0.19724995	0.752965334	0.049784715
115	0.16947627	0.776221226	0.054302507
116	0.14487622	0.79616395	0.058959835
117	0.12330666	0.812956522	0.063736819
118	0.10456123	0.826824215	0.068614558
119	0.08839438	0.838030122	0.073575503
120	0.07454195	0.846854368	0.078603684
121	0.06273735	0.853577837	0.08368481
122	0.05272328	0.858470447	0.088806277
123	0.0442594	0.861783501	0.0939571
124	0.03712684	0.863745358	0.099127801

125	0.0311301	0.864559627	0.104310273
126	0.02609721	0.864405155	0.10949763
127	0.02187876	0.863437176	0.114684061
128	0.01834616	0.861789158	0.119864684
129	0.01538959	0.859574991	0.125035419
130	0.01291586	0.856891271	0.130192869
131	0.01084624	0.853819544	0.135334217
132	0.00911448	0.850428383	0.140457134
133	0.00766501	0.84677529	0.145559705
134	0.00645127	0.842908369	0.150640356
135	0.0054344	0.838867793	0.155697807
136	0.00458192	0.834687072	0.160731013
137	0.00386674	0.830394124	0.165739136
138	0.0032663	0.826012201	0.1707215
139	0.00276177	0.821560654	0.175677574
140	0.00233748	0.817055587	0.180606938
141	0.00198033	0.812510395	0.185509271
142	0.00167944	0.807936223	0.190384333
143	0.00142571	0.803342343	0.195231951
144	0.00121153	0.798736466	0.200052005
145	0.00103057	0.794125005	0.204844424
146	0.00087753	0.789513297	0.209609174
147	0.00074797	0.784905774	0.214346253
148	0.00063819	0.780306125	0.219055688
149	0.00054506	0.775717411	0.223737525
150	0.000466	0.771142173	0.228391829
151	0.0003988	0.766582518	0.233018682
152	0.00034163	0.762040192	0.237618177
153	0.00029295	0.757516633	0.242190419
154	0.00025145	0.753013031	0.246735518
155	0.00021604	0.748530361	0.251253597
156	0.0001858	0.744069419	0.255744779
157	0.00015995	0.739630855	0.260209195
158	0.00013783	0.735215193	0.26464698
159	0.00011888	0.730822851	0.269058272
160	0.00010263	0.72645416	0.273443209
161	8.8689E-05	0.722109377	0.277801934
162	7.6713E-05	0.717788697	0.28213459
163	6.6416E-05	0.713492262	0.286441322
164	5.7555E-05	0.70922017	0.290722276
165	4.9922E-05	0.704972482	0.294977597
166	4.334E-05	0.700749228	0.299207432
167	3.7661E-05	0.696550412	0.303411927

168	3.2756E-05	0.692376015	0.307591229
169	2.8515E-05	0.688226	0.311745486
170	2.4845E-05	0.684100314	0.315874842
171	2.1666E-05	0.67999889	0.319979443
172	1.8911E-05	0.675921652	0.324059437
173	1.6521E-05	0.671868512	0.328114967
174	1.4445E-05	0.667839377	0.332146178
175	1.2641E-05	0.663834145	0.336153214
176	1.1072E-05	0.659852709	0.340136219
177	9.7058E-06	0.655894959	0.344095335
178	8.5154E-06	0.65196078	0.348030705
179	7.4772E-06	0.648050053	0.35194247
180	6.5711E-06	0.644162659	0.35583077
181	5.7795E-06	0.640298475	0.359695746
182	5.0875E-06	0.636457376	0.363537537
183	4.482E-06	0.632639237	0.367356281
184	3.9518E-06	0.628843932	0.371152116
185	3.4871E-06	0.625071333	0.37492518
186	3.0795E-06	0.621321313	0.378675608
187	2.7217E-06	0.617593743	0.382403536
188	2.4074E-06	0.613888494	0.386109098
189	2.131E-06	0.61020544	0.389792429
190	1.8878E-06	0.60654445	0.393453662
191	1.6737E-06	0.602905398	0.397092929
192	1.485E-06	0.599288154	0.400710361
193	1.3186E-06	0.595692592	0.40430609
194	1.1717E-06	0.592118583	0.407880245
195	1.042E-06	0.588566001	0.411432957
196	9.2729E-07	0.58503472	0.414964353
197	8.2584E-07	0.581524613	0.418474561
198	7.3603E-07	0.578035555	0.421963709
199	6.5647E-07	0.574567421	0.425431922
200	5.8594E-07	0.571120087	0.428879327
201	5.2336E-07	0.567693429	0.432306047
202	4.678E-07	0.564287324	0.435712208
203	4.1844E-07	0.56090165	0.439097932
204	3.7455E-07	0.557536284	0.442463342
205	3.355E-07	0.554191105	0.445808559
206	3.0073E-07	0.550865993	0.449133706
207	2.6975E-07	0.547560828	0.452438902
208	2.4213E-07	0.544275491	0.455724267
209	2.1749E-07	0.541009863	0.45898992
210	1.9548E-07	0.537763825	0.462235979

211	1.7583E-07	0.534537262	0.465462562
212	1.5825E-07	0.531330056	0.468669786
213	1.4253E-07	0.528142092	0.471857766
214	1.2845E-07	0.524973253	0.475026619
215	1.1584E-07	0.521823426	0.478176458
216	1.0454E-07	0.518692497	0.481307399
217	9.4397E-08	0.515580352	0.484419554
218	8.5296E-08	0.512486879	0.487513036
219	7.7122E-08	0.509411966	0.490587957
220	6.9775E-08	0.506355501	0.493644429
221	6.3168E-08	0.503317375	0.496682562
222	5.7223E-08	0.500297477	0.499702466
223	5.1869E-08	0.497295697	0.502704251
224	4.7046E-08	0.494311928	0.505688025
225	4.2697E-08	0.491346061	0.508653897
226	3.8774E-08	0.488397988	0.511601973
227	3.5233E-08	0.485467604	0.514532361
228	3.2034E-08	0.482554801	0.517445167
229	2.9143E-08	0.479659476	0.520340495
230	2.6529E-08	0.476781521	0.523218452
231	2.4164E-08	0.473920835	0.526079141
232	2.2023E-08	0.471077312	0.528922666
233	2.0083E-08	0.46825085	0.53174913
234	1.8324E-08	0.465441346	0.534558635
235	1.6729E-08	0.4626487	0.537351283
236	1.5282E-08	0.459872809	0.540127176
237	1.3968E-08	0.457113574	0.542886412
238	1.2774E-08	0.454370893	0.545629094
239	1.1688E-08	0.451644669	0.548355319
240	1.0701E-08	0.448934802	0.551065187
241	9.8028E-09	0.446241194	0.553758796
242	8.9848E-09	0.443563748	0.556436243
243	8.2395E-09	0.440902366	0.559097626
244	7.5602E-09	0.438256953	0.56174304
245	6.9406E-09	0.435627411	0.564372582
246	6.3752E-09	0.433013648	0.566986346
247	5.859E-09	0.430415566	0.569584428
248	5.3874E-09	0.427833073	0.572166921
249	4.9564E-09	0.425266075	0.57473392
250	4.5622E-09	0.422714479	0.577285516
251	4.2016E-09	0.420178193	0.579821803
252	3.8715E-09	0.417657124	0.582342872
253	3.5691E-09	0.415151181	0.584848815

254	3.292E-09	0.412660275	0.587339722
255	3.038E-09	0.410184313	0.589815684
256	2.805E-09	0.407723208	0.59227679
257	2.5911E-09	0.405276869	0.594723129
258	2.3947E-09	0.402845207	0.59715479
259	2.2143E-09	0.400428136	0.599571861
260	2.0485E-09	0.398025568	0.60197443
261	1.896E-09	0.395637415	0.604362584
262	1.7558E-09	0.39326359	0.606736408
263	1.6266E-09	0.390904009	0.60909599
264	1.5077E-09	0.388558585	0.611441414
265	1.3982E-09	0.386227233	0.613772765
266	1.2972E-09	0.38390987	0.616090129
267	1.2041E-09	0.381606411	0.618393588
268	1.1182E-09	0.379316773	0.620683226
269	1.0388E-09	0.377040872	0.622959127
270	9.656E-10	0.374778627	0.625221372
271	8.9792E-10	0.372529955	0.627470044
272	8.3537E-10	0.370294776	0.629705224
273	7.7753E-10	0.368073007	0.631926992
274	7.2401E-10	0.365864569	0.63413543
275	6.7447E-10	0.363669382	0.636330618
276	6.2861E-10	0.361487365	0.638512634
277	5.8611E-10	0.359318441	0.640681558
278	5.4673E-10	0.357162531	0.642837469
279	5.1022E-10	0.355019555	0.644980444
280	4.7634E-10	0.352889438	0.647110561
281	4.4491E-10	0.350772102	0.649227898
282	4.1573E-10	0.348667469	0.651332531
283	3.8862E-10	0.346575464	0.653424535
284	3.6343E-10	0.344496011	0.655503988
285	3.4002E-10	0.342429035	0.657570964
286	3.1825E-10	0.340374461	0.659625538
287	2.9799E-10	0.338332214	0.661667785
288	2.7914E-10	0.336302221	0.663697779
289	2.6158E-10	0.334284408	0.665715592
290	2.4523E-10	0.332278701	0.667721298
291	2.2999E-10	0.330285029	0.669714971
292	2.1579E-10	0.328303319	0.671696681
293	2.0254E-10	0.326333499	0.673666501
294	1.9018E-10	0.324375498	0.675624502
295	1.7864E-10	0.322429245	0.677570755
296	1.6787E-10	0.32049467	0.67950533

297	1.5781E-10	0.318571702	0.681428298
298	1.4841E-10	0.316660272	0.683339728
299	1.3962E-10	0.31476031	0.68523969
300	1.314E-10	0.312871748	0.687128252
301	1.2372E-10	0.310994518	0.689005482
302	1.1652E-10	0.30912855	0.690871449
303	1.0979E-10	0.307273779	0.692726221
304	1.0348E-10	0.305430137	0.694569863
305	9.7567E-11	0.303597556	0.696402444
306	9.2028E-11	0.30177597	0.69822403
307	8.6835E-11	0.299965315	0.700034685
308	8.1964E-11	0.298165523	0.701834477
309	7.7394E-11	0.29637653	0.70362347
310	7.3105E-11	0.29459827	0.70540173
311	6.9077E-11	0.292830681	0.707169319
312	6.5295E-11	0.291073697	0.708926303
313	6.1741E-11	0.289327255	0.710672745
314	5.84E-11	0.287591291	0.712408709
315	5.5259E-11	0.285865743	0.714134257
316	5.2305E-11	0.284150549	0.715849451
317	4.9526E-11	0.282445645	0.717554354
318	4.691E-11	0.280750972	0.719249028
319	4.4447E-11	0.279066466	0.720933534
320	4.2128E-11	0.277392067	0.722607933
321	3.9943E-11	0.275727715	0.724272285
322	3.7883E-11	0.274073348	0.725926652
323	3.5942E-11	0.272428908	0.727571092
324	3.4111E-11	0.270794335	0.729205665
325	3.2383E-11	0.269169569	0.730830431
326	3.0753E-11	0.267554551	0.732445449
327	2.9215E-11	0.265949224	0.734050776
328	2.7762E-11	0.264353529	0.735646471
329	2.6389E-11	0.262767408	0.737232592
330	2.5093E-11	0.261190803	0.738809197
331	2.3867E-11	0.259623658	0.740376342
332	2.2708E-11	0.258065916	0.741934084
333	2.1612E-11	0.256517521	0.743482479
334	2.0576E-11	0.254978416	0.745021584
335	1.9595E-11	0.253448545	0.746551455
336	1.8666E-11	0.251927854	0.748072146
337	1.7787E-11	0.250416287	0.749583713
338	1.6954E-11	0.248913789	0.751086211
339	1.6165E-11	0.247420306	0.752579694

340	1.5417E-11	0.245935785	0.754064215
341	1.4708E-11	0.24446017	0.75553983
342	1.4035E-11	0.242993409	0.757006591
343	1.3398E-11	0.241535448	0.758464552
344	1.2792E-11	0.240086236	0.759913764
345	1.2218E-11	0.238645718	0.761354282
346	1.1673E-11	0.237213844	0.762786156
347	1.1155E-11	0.235790561	0.764209439
348	1.0663E-11	0.234375818	0.765624182
349	1.0196E-11	0.232969563	0.767030437
350	9.7516E-12	0.231571745	0.768428255
351	9.3294E-12	0.230182315	0.769817685
352	8.9278E-12	0.228801221	0.771198779
353	8.5458E-12	0.227428414	0.772571586
354	8.1824E-12	0.226063843	0.773936157
355	7.8365E-12	0.22470746	0.77529254
356	7.5072E-12	0.223359215	0.776640785
357	7.1936E-12	0.22201906	0.77798094
358	6.8949E-12	0.220686946	0.779313054
359	6.6104E-12	0.219362824	0.780637176
360	6.3392E-12	0.218046647	0.781953353
361	6.0808E-12	0.216738367	0.783261633
362	5.8343E-12	0.215437937	0.784562063
363	5.5993E-12	0.214145309	0.785854691
364	5.375E-12	0.212860437	0.787139563
365	5.1611E-12	0.211583275	0.788416725
366	4.9569E-12	0.210313775	0.789686225
367	4.7619E-12	0.209051893	0.790948107
368	4.5758E-12	0.207797581	0.792202419
369	4.398E-12	0.206550796	0.793449204
370	4.2281E-12	0.205311491	0.794688509
371	4.0658E-12	0.204079622	0.795920378
372	3.9106E-12	0.202855144	0.797144856
373	3.7623E-12	0.201638013	0.798361987
374	3.6204E-12	0.200428185	0.799571815
375	3.4847E-12	0.199225616	0.800774384
376	3.3549E-12	0.198030262	0.801969738
377	3.2306E-12	0.196842081	0.803157919
378	3.1117E-12	0.195661028	0.804338972
379	2.9979E-12	0.194487062	0.805512938
380	2.8888E-12	0.19332014	0.80667986
381	2.7844E-12	0.192160219	0.807839781
382	2.6844E-12	0.191007258	0.808992742

383	2.5885E-12	0.189861214	0.810138786
384	2.4966E-12	0.188722047	0.811277953
385	2.4085E-12	0.187589715	0.812410285
386	2.324E-12	0.186464176	0.813535824
387	2.2429E-12	0.185345391	0.814654609
388	2.1652E-12	0.184233319	0.815766681
389	2.0906E-12	0.183127919	0.816872081
390	2.019E-12	0.182029151	0.817970849
391	1.9503E-12	0.180936977	0.819063023
392	1.8843E-12	0.179851355	0.820148645
393	1.8209E-12	0.178772247	0.821227753
394	1.7601E-12	0.177699613	0.822300387
395	1.7016E-12	0.176633415	0.823366585
396	1.6454E-12	0.175573615	0.824426385
397	1.5913E-12	0.174520173	0.825479827
398	1.5394E-12	0.173473052	0.826526948
399	1.4895E-12	0.172432214	0.827567786
400	1.4414E-12	0.171397621	0.828602379
401	1.3952E-12	0.170369235	0.829630765
402	1.3508E-12	0.169347019	0.830652981
403	1.308E-12	0.168330937	0.831669063
404	1.2668E-12	0.167320952	0.832679048
405	1.2272E-12	0.166317026	0.833682974
406	1.189E-12	0.165319124	0.834680876
407	1.1523E-12	0.164327209	0.835672791
408	1.1169E-12	0.163341246	0.836658754
409	1.0828E-12	0.162361198	0.837638802
410	1.0499E-12	0.161387031	0.838612969
411	1.0182E-12	0.160418709	0.839581291
412	9.8765E-13	0.159456197	0.840543803
413	9.582E-13	0.15849946	0.84150054
414	9.298E-13	0.157548463	0.842451537
415	9.0241E-13	0.156603172	0.843396828
416	8.7598E-13	0.155663553	0.844336447
417	8.5048E-13	0.154729572	0.845270428
418	8.2587E-13	0.153801194	0.846198806
419	8.0212E-13	0.152878387	0.847121613
420	7.7919E-13	0.151961117	0.848038883
421	7.5705E-13	0.15104935	0.84895065
422	7.3566E-13	0.150143054	0.849856946
423	7.1501E-13	0.149242196	0.850757804
424	6.9505E-13	0.148346742	0.851653258
425	6.7577E-13	0.147456662	0.852543338

426	6.5714E-13	0.146571922	0.853428078
427	6.3913E-13	0.145692491	0.854307509
428	6.2171E-13	0.144818336	0.855181664
429	6.0488E-13	0.143949426	0.856050574
430	5.886E-13	0.143085729	0.856914271
431	5.7285E-13	0.142227215	0.857772785
432	5.5761E-13	0.141373851	0.858626149
433	5.4287E-13	0.140525608	0.859474392
434	5.286E-13	0.139682455	0.860317545
435	5.148E-13	0.13884436	0.86115564
436	5.0143E-13	0.138011294	0.861988706
437	4.8849E-13	0.137183226	0.862816774
438	4.7596E-13	0.136360127	0.863639873
439	4.6382E-13	0.135541966	0.864458034
440	4.5206E-13	0.134728714	0.865271286
441	4.4068E-13	0.133920342	0.866079658
442	4.2964E-13	0.13311682	0.86688318
443	4.1894E-13	0.132318119	0.867681881
444	4.0858E-13	0.13152421	0.86847579
445	3.9853E-13	0.130735065	0.869264935
446	3.8879E-13	0.129950654	0.870049346
447	3.7934E-13	0.12917095	0.87082905
448	3.7018E-13	0.128395925	0.871604075
449	3.6129E-13	0.127625549	0.872374451
450	3.5267E-13	0.126859796	0.873140204
451	3.443E-13	0.126098637	0.873901363
452	3.3618E-13	0.125342045	0.874657955
453	3.283E-13	0.124589993	0.875410007
454	3.2065E-13	0.123842453	0.876157547
455	3.1323E-13	0.123099398	0.876900602
456	3.0602E-13	0.122360802	0.877639198
457	2.9901E-13	0.121626637	0.878373363
458	2.9221E-13	0.120896877	0.879103123
459	2.8561E-13	0.120171496	0.879828504
460	2.7919E-13	0.119450467	0.880549533
461	2.7295E-13	0.118733764	0.881266236
462	2.6689E-13	0.118021362	0.881978638
463	2.61E-13	0.117313234	0.882686766
464	2.5528E-13	0.116609354	0.883390646
465	2.4971E-13	0.115909698	0.884090302
466	2.443E-13	0.11521424	0.88478576
467	2.3903E-13	0.114522954	0.885477046
468	2.3391E-13	0.113835817	0.886164183

469	2.2893E-13	0.113152802	0.886847198
470	2.2409E-13	0.112473885	0.887526115
471	2.1938E-13	0.111799042	0.888200958
472	2.1479E-13	0.111128247	0.888871753
473	2.1033E-13	0.110461478	0.889538522
474	2.0598E-13	0.109798709	0.890201291
475	2.0175E-13	0.109139917	0.890860083
476	1.9764E-13	0.108485077	0.891514923
477	1.9363E-13	0.107834167	0.892165833
478	1.8972E-13	0.107187162	0.892812838
479	1.8592E-13	0.106544039	0.893455961
480	1.8221E-13	0.105904775	0.894095225
481	1.7861E-13	0.105269346	0.894730654
482	1.7509E-13	0.10463773	0.89536227
483	1.7166E-13	0.104009904	0.895990096
484	1.6833E-13	0.103385844	0.896614156
485	1.6507E-13	0.102765529	0.897234471
486	1.619E-13	0.102148936	0.897851064
487	1.5881E-13	0.101536042	0.898463958
488	1.5579E-13	0.100926826	0.899073174
489	1.5285E-13	0.100321265	0.899678735
490	1.4998E-13	0.099719337	0.900280663
491	1.4719E-13	0.099121021	0.900878979
492	1.4446E-13	0.098526295	0.901473705
493	1.418E-13	0.097935138	0.902064862
494	1.392E-13	0.097347527	0.902652473
495	1.3667E-13	0.096763442	0.903236558
496	1.3419E-13	0.096182861	0.903817139
497	1.3178E-13	0.095605764	0.904394236
498	1.2942E-13	0.095032129	0.904967871
499	1.2712E-13	0.094461936	0.905538064
500	1.2488E-13	0.093895165	0.906104835
501	1.2269E-13	0.093331794	0.906668206
502	1.2054E-13	0.092771803	0.907228197
503	1.1845E-13	0.092215172	0.907784828
504	1.1641E-13	0.091661881	0.908338119
505	1.1441E-13	0.091111191	0.90888809
506	1.1247E-13	0.090565238	0.909434762
507	1.1056E-13	0.090021847	0.909978153
508	1.087E-13	0.089481716	0.910518284
509	1.0688E-13	0.088944826	0.911055174
510	1.051E-13	0.088411157	0.911588843
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514	9.8382E-14	0.086308309	0.913691691
515	9.6794E-14	0.08579046	0.91420954
516	9.5241E-14	0.085275717	0.914724283
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519	9.0784E-14	0.083749945	0.916250055
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521	8.7971E-14	0.082747961	0.917252039
522	8.661E-14	0.082251473	0.917748527
523	8.5277E-14	0.081757964	0.918242036
524	8.3974E-14	0.081267417	0.918732583
525	8.2697E-14	0.080779812	0.919220188
526	8.1448E-14	0.080295133	0.919704867
527	8.0225E-14	0.079813362	0.920186638
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529	7.7856E-14	0.078858475	0.921141525
530	7.6707E-14	0.078385324	0.921614676
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532	7.4482E-14	0.077447522	0.922552478
533	7.3403E-14	0.076982837	0.923017163
534	7.2346E-14	0.07652094	0.92347906
535	7.1311E-14	0.076061815	0.923938185
536	7.0297E-14	0.075605444	0.924394556
537	6.9303E-14	0.075151811	0.924848189
538	6.8329E-14	0.0747009	0.9252991
539	6.7375E-14	0.074252695	0.925747305
540	6.6439E-14	0.073807179	0.926192821
541	6.5522E-14	0.073364336	0.926635664
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543	6.3742E-14	0.072486605	0.927513395
544	6.2878E-14	0.072051685	0.927948315
545	6.2031E-14	0.071619375	0.928380625
546	6.12E-14	0.071189659	0.928810341
547	6.0385E-14	0.070762521	0.929237479
548	5.9586E-14	0.070337946	0.929662054
549	5.8802E-14	0.069915918	0.930084082
550	5.8034E-14	0.069496422	0.930503578
551	5.7279E-14	0.069079444	0.930920556
552	5.6539E-14	0.068664967	0.931335033
553	5.5813E-14	0.068252977	0.931747023
554	5.5101E-14	0.06784346	0.93215654

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556	5.3716E-14	0.06703178	0.93296822
557	5.3043E-14	0.06662959	0.93337041
558	5.2382E-14	0.066229812	0.933770188
559	5.1733E-14	0.065832433	0.934167567
560	5.1096E-14	0.065437439	0.934562561
561	5.0471E-14	0.065044814	0.934955186
562	4.9857E-14	0.064654545	0.935345455
563	4.9254E-14	0.064266618	0.935733382
564	4.8662E-14	0.063881018	0.936118982
565	4.8081E-14	0.063497732	0.936502268
566	4.751E-14	0.063116746	0.936883254
567	4.6949E-14	0.062738045	0.937261955
568	4.6399E-14	0.062361617	0.937638383
569	4.5857E-14	0.061987447	0.938012553
570	4.5326E-14	0.061615523	0.938384477
571	4.4804E-14	0.061245829	0.938754171
572	4.429E-14	0.060878354	0.939121646
573	4.3786E-14	0.060513084	0.939486916
574	4.3291E-14	0.060150006	0.939849994
575	4.2804E-14	0.059789106	0.940210894
576	4.2325E-14	0.059430371	0.940569629
577	4.1855E-14	0.059073789	0.940926211
578	4.1393E-14	0.058719346	0.941280654
579	4.0938E-14	0.05836703	0.94163297
580	4.0491E-14	0.058016828	0.941983172
581	4.0052E-14	0.057668727	0.942331273
582	3.962E-14	0.057322715	0.942677285
583	3.9195E-14	0.056978778	0.943021222
584	3.8778E-14	0.056636906	0.943363094
585	3.8367E-14	0.056297084	0.943702916
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587	3.7566E-14	0.055623546	0.944376454
588	3.7175E-14	0.055289805	0.944710195
589	3.6791E-14	0.054958066	0.945041934
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591	3.6041E-14	0.054300547	0.945699453
592	3.5675E-14	0.053974744	0.946025256
593	3.5315E-14	0.053650896	0.946349104
594	3.496E-14	0.05332899	0.94667101
595	3.4612E-14	0.053009016	0.946990984
596	3.4269E-14	0.052690962	0.947309038
597	3.3931E-14	0.052374817	0.947625183

598	3.3599E-14	0.052060568	0.947939432
599	3.3271E-14	0.051748204	0.948251796
600	3.2949E-14	0.051437715	0.948562285
601	3.2633E-14	0.051129089	0.948870911
602	3.2321E-14	0.050822314	0.949177686
603	3.2013E-14	0.05051738	0.94948262
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606	3.112E-14	0.049613512	0.950386488
607	3.0831E-14	0.049315831	0.950684169
608	3.0547E-14	0.049019936	0.950980064
609	3.0267E-14	0.048725817	0.951274183
610	2.9991E-14	0.048433462	0.951566538
611	2.972E-14	0.048142861	0.951857139
612	2.9452E-14	0.047854004	0.952145996
613	2.9188E-14	0.04756688	0.95243312
614	2.8929E-14	0.047281479	0.952718521
615	2.8673E-14	0.04699779	0.95300221
616	2.8421E-14	0.046715803	0.953284197
617	2.8173E-14	0.046435508	0.953564492
618	2.7928E-14	0.046156895	0.953843105
619	2.7687E-14	0.045879954	0.954120046
620	2.7449E-14	0.045604674	0.954395326
621	2.7215E-14	0.045331046	0.954668954
622	2.6985E-14	0.04505906	0.95494094
623	2.6757E-14	0.044788705	0.955211295
624	2.6533E-14	0.044519973	0.955480027
625	2.6312E-14	0.044252853	0.955747147
626	2.6095E-14	0.043987336	0.956012664
627	2.588E-14	0.043723412	0.956276588
628	2.5668E-14	0.043461072	0.956538928
629	2.546E-14	0.043200305	0.956799695
630	2.5254E-14	0.042941103	0.957058897
631	2.5051E-14	0.042683457	0.957316543
632	2.4851E-14	0.042427356	0.957572644
633	2.4654E-14	0.042172792	0.957827208
634	2.446E-14	0.041919755	0.958080245
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636	2.4079E-14	0.041418227	0.958581773
637	2.3892E-14	0.041169718	0.958830282
638	2.3708E-14	0.0409227	0.9590773
639	2.3527E-14	0.040677163	0.959322837
640	2.3348E-14	0.0404331	0.9595669

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642	2.2997E-14	0.039949359	0.960050641
643	2.2826E-14	0.039709663	0.960290337
644	2.2656E-14	0.039471405	0.960528595
645	2.2489E-14	0.039234576	0.960765424
646	2.2324E-14	0.038999169	0.961000831
647	2.2161E-14	0.038765174	0.961234826
648	2.2E-14	0.038532583	0.961467417
649	2.1842E-14	0.038301387	0.961698613
650	2.1685E-14	0.038071579	0.961928421
651	2.1531E-14	0.037843149	0.962156851
652	2.1379E-14	0.037616091	0.962383909
653	2.1228E-14	0.037390394	0.962609606
654	2.108E-14	0.037166052	0.962833948
655	2.0933E-14	0.036943055	0.963056945
656	2.0789E-14	0.036721397	0.963278603
657	2.0646E-14	0.036501069	0.963498931
658	2.0505E-14	0.036282062	0.963717938
659	2.0366E-14	0.03606437	0.96393563
660	2.0229E-14	0.035847984	0.964152016
661	2.0093E-14	0.035632896	0.964367104
662	1.9959E-14	0.035419098	0.964580902
663	1.9827E-14	0.035206584	0.964793416
664	1.9696E-14	0.034995344	0.965004656
665	1.9567E-14	0.034785372	0.965214628
666	1.944E-14	0.03457666	0.96542334
667	1.9314E-14	0.0343692	0.9656308
668	1.919E-14	0.034162985	0.965837015
669	1.9068E-14	0.033958007	0.966041993
670	1.8947E-14	0.033754259	0.966245741
671	1.8827E-14	0.033551733	0.966448267
672	1.8709E-14	0.033350423	0.966649577
673	1.8592E-14	0.03315032	0.96684968
674	1.8477E-14	0.032951418	0.967048582
675	1.8363E-14	0.03275371	0.96724629
676	1.8251E-14	0.032557188	0.967442812
677	1.814E-14	0.032361844	0.967638156
678	1.803E-14	0.032167673	0.967832327
679	1.7921E-14	0.031974667	0.968025333
680	1.7814E-14	0.031782819	0.968217181
681	1.7708E-14	0.031592122	0.968407878
682	1.7604E-14	0.03140257	0.96859743
683	1.75E-14	0.031214154	0.968785846

684	1.7398E-14	0.031026869	0.968973131
685	1.7297E-14	0.030840708	0.969159292
686	1.7197E-14	0.030655664	0.969344336
687	1.7099E-14	0.03047173	0.96952827
688	1.7001E-14	0.0302889	0.9697111
689	1.6905E-14	0.030107166	0.969892834
690	1.681E-14	0.029926523	0.970073477
691	1.6716E-14	0.029746964	0.970253036
692	1.6623E-14	0.029568482	0.970431518
693	1.6531E-14	0.029391071	0.970608929
694	1.644E-14	0.029214725	0.970785275
695	1.635E-14	0.029039437	0.970960563
696	1.6262E-14	0.0288652	0.9711348
697	1.6174E-14	0.028692009	0.971307991
698	1.6087E-14	0.028519857	0.971480143
699	1.6001E-14	0.028348738	0.971651262
700	1.5916E-14	0.028178645	0.971821355
701	1.5832E-14	0.028009573	0.971990427
702	1.575E-14	0.027841516	0.972158484
703	1.5668E-14	0.027674467	0.972325533
704	1.5586E-14	0.02750842	0.97249158
705	1.5506E-14	0.027343369	0.972656631
706	1.5427E-14	0.027179309	0.972820691
707	1.5349E-14	0.027016233	0.972983767
708	1.5271E-14	0.026854136	0.973145864
709	1.5194E-14	0.026693011	0.973306989
710	1.5119E-14	0.026532853	0.973467147
711	1.5044E-14	0.026373656	0.973626344
712	1.4969E-14	0.026215414	0.973784586
713	1.4896E-14	0.026058122	0.973941878
714	1.4823E-14	0.025901773	0.974098227
715	1.4752E-14	0.025746362	0.974253638
716	1.4681E-14	0.025591884	0.974408116
717	1.461E-14	0.025438333	0.974561667
718	1.4541E-14	0.025285703	0.974714297
719	1.4472E-14	0.025133988	0.974866012
720	1.4404E-14	0.024983185	0.975016815
721	1.4337E-14	0.024833285	0.975166715
722	1.427E-14	0.024684286	0.975315714
723	1.4204E-14	0.02453618	0.97546382
724	1.4139E-14	0.024388963	0.975611037
725	1.4075E-14	0.024242629	0.975757371
726	1.4011E-14	0.024097173	0.975902827

727	1.3948E-14	0.02395259	0.97604741
728	1.3885E-14	0.023808875	0.976191125
729	1.3823E-14	0.023666022	0.976333978
730	1.3762E-14	0.023524025	0.976475975
731	1.3702E-14	0.023382881	0.976617119
732	1.3642E-14	0.023242584	0.976757416
733	1.3582E-14	0.023103128	0.976896872
734	1.3524E-14	0.02296451	0.97703549
735	1.3466E-14	0.022826723	0.977173277
736	1.3408E-14	0.022689762	0.977310238
737	1.3351E-14	0.022553624	0.977446376
738	1.3295E-14	0.022418302	0.977581698
739	1.3239E-14	0.022283792	0.977716208
740	1.3184E-14	0.022150089	0.977849911
741	1.313E-14	0.022017189	0.977982811
742	1.3075E-14	0.021885086	0.978114914
743	1.3022E-14	0.021753775	0.978246225
744	1.2969E-14	0.021623253	0.978376747
745	1.2917E-14	0.021493513	0.978506487
746	1.2865E-14	0.021364552	0.978635448
747	1.2813E-14	0.021236365	0.978763635
748	1.2762E-14	0.021108946	0.978891054
749	1.2712E-14	0.020982293	0.979017707
750	1.2662E-14	0.020856399	0.979143601
751	1.2613E-14	0.020731261	0.979268739
752	1.2564E-14	0.020606873	0.979393127
753	1.2515E-14	0.020483232	0.979516768
754	1.2467E-14	0.020360332	0.979639668
755	1.242E-14	0.02023817	0.97976183
756	1.2373E-14	0.020116741	0.979883259
757	1.2326E-14	0.019996041	0.980003959
758	1.228E-14	0.019876065	0.980123935
759	1.2235E-14	0.019756808	0.980243192
760	1.2189E-14	0.019638268	0.980361732
761	1.2145E-14	0.019520438	0.980479562
762	1.21E-14	0.019403315	0.980596685
763	1.2056E-14	0.019286895	0.980713105
764	1.2013E-14	0.019171174	0.980828826
765	1.197E-14	0.019056147	0.980943853
766	1.1927E-14	0.01894181	0.98105819
767	1.1885E-14	0.018828159	0.981171841
768	1.1843E-14	0.01871519	0.98128481
769	1.1802E-14	0.018602899	0.981397101

770	1.1761E-14	0.018491282	0.981508718
771	1.172E-14	0.018380334	0.981619666
772	1.168E-14	0.018270052	0.981729948
773	1.164E-14	0.018160432	0.981839568
774	1.16E-14	0.018051469	0.981948531
775	1.1561E-14	0.01794316	0.98205684
776	1.1522E-14	0.017835501	0.982164499
777	1.1484E-14	0.017728488	0.982271512
778	1.1446E-14	0.017622117	0.982377883
779	1.1408E-14	0.017516385	0.982483615
780	1.1371E-14	0.017411286	0.982588714
781	1.1334E-14	0.017306819	0.982693181
782	1.1297E-14	0.017202978	0.982797022
783	1.1261E-14	0.01709976	0.98290024
784	1.1225E-14	0.016997161	0.983002839
785	1.1189E-14	0.016895178	0.983104822
786	1.1154E-14	0.016793807	0.983206193
787	1.1119E-14	0.016693044	0.983306956
788	1.1084E-14	0.016592886	0.983407114
789	1.105E-14	0.016493329	0.983506671
790	1.1015E-14	0.016394369	0.983605631
791	1.0982E-14	0.016296003	0.983703997
792	1.0948E-14	0.016198227	0.983801773
793	1.0915E-14	0.016101037	0.983898963
794	1.0882E-14	0.016004431	0.983995569
795	1.085E-14	0.015908405	0.984091595
796	1.0817E-14	0.015812954	0.984187046
797	1.0785E-14	0.015718076	0.984281924
798	1.0754E-14	0.015623768	0.984376232
799	1.0722E-14	0.015530025	0.984469975
800	1.0691E-14	0.015436845	0.984563155

$dt = 20$. t increment is 20

Time/Day	Susceptible	Infected	Removed
0	0.99999998	1.82927E-08	0
20	0.99999991	8.45122E-08	2.19512E-09
40	0.9999996	3.90446E-07	1.23366E-08
60	0.99999814	1.80386E-06	5.91901E-08
80	0.99999139	8.33383E-06	2.75654E-07
100	0.99996022	3.8502E-05	1.27571E-06
120	0.99981623	0.000177874	5.89595E-06
140	0.99915111	0.000821654	2.72408E-05

160	0.99608073	0.003793431	0.000125839
180	0.9819489	0.017470047	0.000581051
200	0.91779035	0.079532197	0.002677457
220	0.64479323	0.342985453	0.01222132
240	-0.1823253	1.128945766	0.053379575
260	0.58749914	0.223647798	0.188853067
280	0.09608973	0.688219463	0.215690802
300	-0.1512396	0.852962415	0.298277138
320	0.33122663	0.268140738	0.400632628
340	-0.0009428	0.568133274	0.432809516
360	0.00106047	0.497954023	0.500985509
380	-0.0009145	0.4401745	0.560739992
400	0.00059099	0.385848075	0.613560932
420	-0.0002619	0.340399151	0.659862701
440	7.151E-05	0.299217891	0.700710599
460	-8.515E-06	0.263391769	0.736616746
480	-1.27E-07	0.231776369	0.768223758
500	-1.691E-08	0.203963094	0.796036923
520	-4.011E-09	0.17948751	0.820512494
540	-1.318E-09	0.157949006	0.842050995
560	-5.396E-10	0.138995125	0.861004876
580	-2.591E-10	0.122315709	0.877684291
600	-1.406E-10	0.107637824	0.892362176
620	-8.398E-11	0.094721285	0.905278715
640	-5.423E-11	0.083354731	0.916645269
660	-3.732E-11	0.073352163	0.926647837
680	-2.708E-11	0.064549904	0.935450096
700	-2.055E-11	0.056803915	0.943196085
720	-1.618E-11	0.049987445	0.950012555
740	-1.316E-11	0.043988952	0.956011048
760	-1.099E-11	0.038710278	0.961289722
780	-9.4E-12	0.034065044	0.965934956
800	-8.203E-12	0.029977239	0.970022761

$dt = 0.5$. t increment is 0.5

Time/Day	Susceptible	Infected	Removed
0	0.99999998	1.82927E-08	0
0.5	0.99999998	1.99482E-08	5.48781E-11
1	0.99999998	2.17535E-08	1.14723E-10
1.5	0.99999998	2.37222E-08	1.79983E-10
2	0.99999997	2.5869E-08	2.5115E-10
2.5	0.99999997	2.82102E-08	3.28757E-10

3	0.99999997	3.07632E-08	4.13387E-10
3.5	0.99999997	3.35473E-08	5.05677E-10
4	0.99999996	3.65833E-08	6.06318E-10
4.5	0.99999996	3.98941E-08	7.16068E-10
5	0.99999996	4.35045E-08	8.35751E-10
5.5	0.99999995	4.74416E-08	9.66264E-10
6	0.99999995	5.17351E-08	1.10859E-09
6.5	0.99999994	5.64171E-08	1.26379E-09
7	0.99999994	6.15229E-08	1.43305E-09
7.5	0.99999993	6.70907E-08	1.61761E-09
8	0.99999993	7.31624E-08	1.81889E-09
8.5	0.99999992	7.97836E-08	2.03837E-09
9	0.99999991	8.7004E-08	2.27772E-09
9.5	0.9999999	9.48779E-08	2.53874E-09
10	0.99999989	1.03464E-07	2.82337E-09
10.5	0.99999988	1.12828E-07	3.13376E-09
11	0.99999987	1.23039E-07	3.47225E-09
11.5	0.99999986	1.34174E-07	3.84136E-09
12	0.99999985	1.46317E-07	4.24388E-09
12.5	0.99999984	1.59558E-07	4.68283E-09
13	0.99999982	1.73998E-07	5.16151E-09
13.5	0.9999998	1.89745E-07	5.6835E-09
14	0.99999979	2.06917E-07	6.25274E-09
14.5	0.99999977	2.25643E-07	6.87349E-09
15	0.99999975	2.46064E-07	7.55042E-09
15.5	0.99999972	2.68332E-07	8.28861E-09
16	0.9999997	2.92616E-07	9.09361E-09
16.5	0.99999967	3.19098E-07	9.97146E-09
17	0.99999964	3.47977E-07	1.09288E-08
17.5	0.99999961	3.79468E-07	1.19727E-08
18	0.99999957	4.1381E-07	1.31111E-08
18.5	0.99999953	4.5126E-07	1.43525E-08
19	0.99999949	4.92099E-07	1.57063E-08
19.5	0.99999945	5.36634E-07	1.71826E-08
20	0.9999994	5.852E-07	1.87925E-08
20.5	0.99999934	6.3816E-07	2.05481E-08
21	0.99999928	6.95913E-07	2.24626E-08
21.5	0.99999922	7.58894E-07	2.45503E-08
22	0.99999915	8.27573E-07	2.6827E-08
22.5	0.99999907	9.02469E-07	2.93097E-08
23	0.99999898	9.84142E-07	3.20171E-08
23.5	0.99999889	1.07321E-06	3.49696E-08
24	0.99999879	1.17033E-06	3.81892E-08

24.5	0.99999868	1.27625E-06	4.17002E-08
25	0.99999856	1.39175E-06	4.55289E-08
25.5	0.99999843	1.5177E-06	4.97041E-08
26	0.99999829	1.65505E-06	5.42572E-08
26.5	0.99999814	1.80483E-06	5.92224E-08
27	0.99999797	1.96817E-06	6.46369E-08
27.5	0.99999778	2.14629E-06	7.05414E-08
28	0.99999758	2.34053E-06	7.69803E-08
28.5	0.99999736	2.55235E-06	8.40019E-08
29	0.99999713	2.78333E-06	9.16589E-08
29.5	0.99999686	3.03522E-06	1.00009E-07
30	0.99999658	3.30991E-06	1.09115E-07
30.5	0.99999627	3.60946E-06	1.19044E-07
31	0.99999593	3.93611E-06	1.29873E-07
31.5	0.99999557	4.29233E-06	1.41681E-07
32	0.99999516	4.68078E-06	1.54558E-07
32.5	0.99999473	5.10439E-06	1.686E-07
33	0.99999425	5.56633E-06	1.83913E-07
33.5	0.99999373	6.07008E-06	2.00612E-07
34	0.99999316	6.61942E-06	2.18823E-07
34.5	0.99999254	7.21848E-06	2.38681E-07
35	0.99999187	7.87174E-06	2.60336E-07
35.5	0.99999113	8.58413E-06	2.83952E-07
36	0.99999033	9.36099E-06	3.09704E-07
36.5	0.99998945	1.02081E-05	3.37787E-07
37	0.9999885	1.1132E-05	3.68411E-07
37.5	0.99998746	1.21394E-05	4.01807E-07
38	0.99998632	1.3238E-05	4.38226E-07
38.5	0.99998509	1.4436E-05	4.7794E-07
39	0.99998374	1.57425E-05	5.21248E-07
39.5	0.99998226	1.71671E-05	5.68475E-07
40	0.99998066	1.87207E-05	6.19977E-07
40.5	0.99997891	2.04149E-05	6.76139E-07
41	0.999977	2.22624E-05	7.37384E-07
41.5	0.99997492	2.42771E-05	8.04171E-07
42	0.99997265	2.64742E-05	8.77002E-07
42.5	0.99997017	2.887E-05	9.56425E-07
43	0.99996747	3.14827E-05	1.04304E-06
43.5	0.99996453	3.43318E-05	1.13748E-06
44	0.99996132	3.74387E-05	1.24048E-06
44.5	0.99995782	4.08267E-05	1.35279E-06
45	0.999954	4.45214E-05	1.47527E-06
45.5	0.99994984	4.85504E-05	1.60884E-06

46	0.9999453	5.2944E-05	1.75449E-06
46.5	0.99994035	5.77351E-05	1.91332E-06
47	0.99993495	6.29598E-05	2.08653E-06
47.5	0.99992907	6.86573E-05	2.27541E-06
48	0.99992265	7.48704E-05	2.48138E-06
48.5	0.99991565	8.16456E-05	2.70599E-06
49	0.99990802	8.90339E-05	2.95093E-06
49.5	0.99989969	9.70907E-05	3.21803E-06
50	0.99989061	0.000105876	3.5093E-06
50.5	0.99988072	0.000115457	3.82693E-06
51	0.99986992	0.000125905	4.1733E-06
51.5	0.99985815	0.000137298	4.55102E-06
52	0.99984532	0.000149721	4.96291E-06
52.5	0.99983132	0.000163269	5.41207E-06
53	0.99981606	0.000178042	5.90188E-06
53.5	0.99979941	0.000194152	6.436E-06
54	0.99978126	0.000211719	7.01846E-06
54.5	0.99976147	0.000230875	7.65362E-06
55	0.99973989	0.000251764	8.34624E-06
55.5	0.99971636	0.000274543	9.10154E-06
56	0.99969069	0.000299382	9.92516E-06
56.5	0.99966271	0.000326467	1.08233E-05
57	0.9996322	0.000356002	1.18027E-05
57.5	0.99959892	0.000388208	1.28707E-05
58	0.99956264	0.000423326	1.40353E-05
58.5	0.99952307	0.00046162	1.53053E-05
59	0.99947993	0.000503376	1.66902E-05
59.5	0.99943289	0.000548907	1.82003E-05
60	0.9993816	0.000598554	1.9847E-05
60.5	0.99932567	0.000652688	2.16427E-05
61	0.99926468	0.000711716	2.36008E-05
61.5	0.99919819	0.000776077	2.57359E-05
62	0.99912568	0.000846254	2.80641E-05
62.5	0.99904663	0.00092277	3.06029E-05
63	0.99896043	0.001006199	3.33712E-05
63.5	0.99886645	0.001097162	3.63898E-05
64	0.99876398	0.001196339	3.96813E-05
64.5	0.99865226	0.001304469	4.32703E-05
65	0.99853046	0.00142236	4.71837E-05
65.5	0.99839766	0.001550888	5.14508E-05
66	0.99825289	0.001691011	5.61035E-05
66.5	0.99809505	0.001843771	6.11765E-05
67	0.99792299	0.002010304	6.67078E-05

67.5	0.99773542	0.002191846	7.27387E-05
68	0.99753094	0.002389744	7.93142E-05
68.5	0.99730805	0.002605464	8.64835E-05
69	0.9970651	0.002840603	9.42999E-05
69.5	0.99680028	0.003096898	0.000102822
70	0.99651165	0.00337624	0.000112112
70.5	0.99619707	0.003680689	0.000122241
71	0.99585423	0.004012483	0.000133283
71.5	0.99548062	0.004374057	0.000145321
72	0.9950735	0.004768061	0.000158443
72.5	0.99462988	0.005197374	0.000172747
73	0.99414653	0.005665127	0.000188339
73.5	0.99361995	0.00617472	0.000205334
74	0.99304629	0.006729849	0.000223859
74.5	0.99242143	0.007334525	0.000244048
75	0.99174085	0.007993102	0.000266052
75.5	0.99099966	0.008710305	0.000290031
76	0.99019258	0.009491258	0.000316162
76.5	0.98931385	0.010341513	0.000344636
77	0.98835725	0.011267087	0.00037566
77.5	0.98731605	0.012274493	0.000409462
78	0.98618294	0.013370778	0.000446285
78.5	0.98495004	0.01456356	0.000486397
79	0.98360884	0.015861068	0.000530088
79.5	0.98215014	0.017272187	0.000577671
80	0.98056402	0.018806493	0.000629488
80.5	0.97883979	0.020474304	0.000685907
81	0.97696595	0.022286721	0.00074733
81.5	0.97493014	0.024255671	0.00081419
82	0.97271909	0.026393953	0.000886957
82.5	0.97031858	0.028715281	0.000966139
83	0.96771339	0.031234323	0.001052285
83.5	0.96488727	0.033966739	0.001145988
84	0.9618229	0.036929215	0.001247888
84.5	0.95850184	0.040139487	0.001358676
85	0.95490454	0.043616367	0.001479094
85.5	0.95101031	0.047379743	0.001609943
86	0.94679733	0.051450585	0.001752083
86.5	0.94224264	0.055850924	0.001906434
87	0.93732219	0.060603821	0.002073987
87.5	0.9320109	0.065733305	0.002255799
88	0.9262827	0.071264304	0.002452999
88.5	0.92011068	0.077222529	0.002666792

89	0.9134672	0.083634343	0.002898459
89.5	0.90632406	0.090526581	0.003149362
90	0.89865272	0.097926341	0.003420942
90.5	0.89042455	0.105860728	0.003714721
91	0.88161115	0.114356548	0.004032303
91.5	0.87218466	0.123439963	0.004375373
92	0.86211823	0.133136081	0.004745693
92.5	0.85138639	0.143468513	0.005145101
93	0.83996563	0.154458865	0.005575506
93.5	0.82783493	0.166126191	0.006038883
94	0.81497633	0.178486406	0.006537262
94.5	0.80137562	0.191551663	0.007072721
95	0.78702291	0.205329709	0.007647376
95.5	0.77191339	0.219823244	0.008263365
96	0.75604789	0.235029276	0.008922835
96.5	0.73943356	0.25093852	0.009627922
97	0.72208441	0.26753485	0.010380738
97.5	0.70402183	0.284794832	0.011183343
98	0.68527491	0.302687364	0.012037727
98.5	0.66588076	0.321173451	0.012945789
99	0.64588455	0.340206142	0.013909309
99.5	0.62533943	0.359730642	0.014929928
100	0.60430625	0.379684626	0.01600912
100.5	0.58285307	0.399998754	0.017148174
101	0.56105444	0.420597395	0.01834817
101.5	0.53899049	0.441399549	0.019609962
102	0.51674589	0.46231995	0.020934161
102.5	0.49440856	0.483270321	0.022321121
103	0.47206832	0.504160744	0.023770932
103.5	0.44981548	0.524901104	0.025283414
104	0.42773932	0.545402559	0.026858117
104.5	0.4059267	0.565578978	0.028494325
105	0.38446063	0.585348308	0.030191062
105.5	0.36341907	0.604633819	0.031947107
106	0.34287381	0.623365183	0.033761008
106.5	0.32288953	0.641479366	0.035631104
107	0.30352316	0.6589213	0.037555542
107.5	0.28482336	0.675644337	0.039532306
108	0.26683028	0.691610477	0.041559239
108.5	0.24957555	0.706790381	0.04363407
109	0.23308237	0.721163185	0.045754441
109.5	0.21736592	0.734716151	0.047917931
110	0.20243376	0.747444163	0.050122079

110.5	0.18828647	0.759349122	0.052364412
111	0.17491829	0.770439252	0.054642459
111.5	0.16231786	0.78072836	0.056953777
112	0.15046897	0.790235071	0.059295962
112.5	0.13935127	0.798982063	0.061666667
113	0.12894106	0.806995329	0.064063613
113.5	0.11921193	0.81430347	0.066484599
114	0.11013545	0.820937043	0.06892751
114.5	0.10168171	0.826927966	0.071390321
115	0.09381991	0.832308985	0.073871105
115.5	0.08651876	0.837113207	0.076368032
116	0.07974693	0.841373698	0.078879371
116.5	0.07347336	0.845123143	0.081403492
117	0.06766757	0.848393567	0.083938862
117.5	0.06229985	0.851216103	0.086484043
118	0.05734149	0.853620819	0.089037691
118.5	0.05276486	0.855636584	0.091598553
119	0.04854357	0.85729097	0.094165463
119.5	0.04465247	0.85861019	0.096737336
120	0.04106777	0.859619062	0.099313167
120.5	0.03776697	0.860341002	0.101892024
121	0.03472893	0.860798025	0.104473047
121.5	0.03193378	0.861010775	0.107055441
122	0.02936297	0.860998557	0.109638473
122.5	0.02699915	0.860779379	0.112221469
123	0.02482618	0.86037001	0.114803807
123.5	0.02282905	0.859786032	0.117384917
124	0.02099382	0.859041901	0.119964275
124.5	0.01930759	0.858151008	0.122541401
125	0.01775841	0.857125741	0.125115854
125.5	0.01633522	0.855977545	0.127687231
126	0.01502785	0.854716984	0.130255164
126.5	0.01382689	0.853353799	0.132819315
127	0.01272366	0.851896965	0.135379376
127.5	0.01171019	0.850354744	0.137935067
128	0.01077913	0.848734735	0.140486131
128.5	0.00992374	0.847043928	0.143032335
129	0.00913779	0.845288742	0.145573467
129.5	0.00841559	0.843475076	0.148109333
130	0.0077519	0.841608346	0.150639759
130.5	0.0071419	0.839693521	0.153164584
131	0.00658118	0.83773516	0.155683664
131.5	0.00606568	0.835737446	0.15819687

132	0.0055917	0.833704215	0.160704082
132.5	0.00515582	0.831638983	0.163205195
133	0.00475491	0.829544974	0.165700112
133.5	0.00438611	0.827425142	0.168188747
134	0.00404678	0.825282195	0.170671022
134.5	0.00373452	0.823118614	0.173146869
135	0.0034471	0.820936672	0.175616224
135.5	0.00318251	0.818738454	0.178079034
136	0.00293888	0.816525866	0.18053525
136.5	0.00271451	0.814300658	0.182984827
137	0.00250784	0.812064431	0.185427729
137.5	0.00231742	0.809818653	0.187863923
138	0.00214195	0.807564668	0.190293379
138.5	0.00198022	0.805303707	0.192716073
139	0.00183112	0.803036899	0.195131984
139.5	0.00169363	0.800765275	0.197541094
140	0.00156683	0.798489784	0.19994339
140.5	0.00144985	0.796211292	0.20233886
141	0.00134191	0.793930593	0.204727494
141.5	0.0012423	0.791648415	0.207109285
142	0.00115035	0.789365424	0.209484231
142.5	0.00106544	0.78708223	0.211852327
143	0.00098704	0.784799391	0.214213574
143.5	0.00091461	0.782517421	0.216567972
144	0.00084769	0.780236786	0.218915524
144.5	0.00078585	0.777957916	0.221256234
145	0.00072869	0.775681205	0.223590108
145.5	0.00067584	0.77340701	0.225917152
146	0.00062697	0.771135661	0.228237373
146.5	0.00058176	0.768867459	0.23055078
147	0.00053994	0.766602679	0.232857382
147.5	0.00050124	0.764341572	0.23515719
148	0.00046542	0.762084369	0.237450215
148.5	0.00043225	0.759831279	0.239736468
149	0.00040154	0.757582494	0.242015962
149.5	0.0003731	0.75533819	0.244288709
150	0.00034675	0.753098525	0.246554724
150.5	0.00032233	0.750863646	0.248814019
151	0.0002997	0.748633685	0.25106661
151.5	0.00027873	0.746408762	0.253312511
152	0.00025927	0.744188988	0.255551738
152.5	0.00024123	0.741974462	0.257784305
153	0.0002245	0.739765274	0.260010228

153.5	0.00020897	0.737561506	0.262229524
154	0.00019456	0.735363233	0.264442208
154.5	0.00018118	0.73317052	0.266648298
155	0.00016876	0.730983429	0.26884781
155.5	0.00015723	0.728802013	0.27104076
156	0.00014651	0.726626321	0.273227166
156.5	0.00013656	0.724456396	0.275407045
157	0.00012731	0.722292277	0.277580414
157.5	0.00011871	0.720133998	0.279747291
158	0.00011072	0.717981589	0.281907693
158.5	0.00010329	0.715835077	0.284061638
159	9.6373E-05	0.713694484	0.286209143
159.5	8.9942E-05	0.711559832	0.288350226
160	8.3958E-05	0.709431136	0.290484906
160.5	7.8389E-05	0.707308412	0.292613199
161	7.3205E-05	0.705191671	0.294735125
161.5	6.8378E-05	0.703080923	0.2968507
162	6.3883E-05	0.700976175	0.298959942
162.5	5.9696E-05	0.698877433	0.301062871
163	5.5795E-05	0.696784702	0.303159503
163.5	5.216E-05	0.694697983	0.305249857
164	4.8772E-05	0.692617277	0.307333951
164.5	4.5614E-05	0.690542583	0.309411803
165	4.2668E-05	0.688473901	0.311483431
165.5	3.9922E-05	0.686411226	0.313548852
166	3.736E-05	0.684354554	0.315608086
166.5	3.4969E-05	0.682303881	0.31766115
167	3.2738E-05	0.6802592	0.319708061
167.5	3.0656E-05	0.678220505	0.321748839
168	2.8712E-05	0.676187788	0.323783501
168.5	2.6897E-05	0.674161039	0.325812064
169	2.5201E-05	0.672140252	0.327834547
169.5	2.3617E-05	0.670125415	0.329850968
170	2.2138E-05	0.668116518	0.331861344
170.5	2.0755E-05	0.666113552	0.333865694
171	1.9462E-05	0.664116504	0.335864034
171.5	1.8254E-05	0.662125363	0.337856384
172	1.7124E-05	0.660140117	0.33984276
172.5	1.6067E-05	0.658160753	0.34182318
173	1.5078E-05	0.65618726	0.343797662
173.5	1.4153E-05	0.654219623	0.345766224
174	1.3287E-05	0.65225783	0.347728883
174.5	1.2477E-05	0.650301867	0.349685657

175	1.1718E-05	0.64835172	0.351636562
175.5	1.1008E-05	0.646407375	0.353581617
176	1.0343E-05	0.644468818	0.355520839
176.5	9.7193E-06	0.642536035	0.357454246
177	9.1354E-06	0.640609011	0.359381854
177.5	8.5882E-06	0.638687731	0.361303681
178	8.0753E-06	0.63677218	0.363219744
178.5	7.5945E-06	0.634862345	0.365130061
179	7.1437E-06	0.632958208	0.367034648
179.5	6.721E-06	0.631059757	0.368933522
180	6.3244E-06	0.629166974	0.370826702
180.5	5.9523E-06	0.627279845	0.372714203
181	5.6032E-06	0.625398355	0.374596042
181.5	5.2756E-06	0.623522487	0.376472237
182	4.968E-06	0.621652227	0.378342805
182.5	4.6793E-06	0.619787559	0.380207761
183	4.4081E-06	0.617928468	0.382067124
183.5	4.1534E-06	0.616074937	0.383920909
184	3.9142E-06	0.614226952	0.385769134
184.5	3.6894E-06	0.612384495	0.387611815
185	3.4781E-06	0.610547553	0.389448969
185.5	3.2796E-06	0.608716109	0.391280611
186	3.0929E-06	0.606890147	0.39310676
186.5	2.9174E-06	0.605069653	0.39492743
187	2.7524E-06	0.603254609	0.396742639
187.5	2.5971E-06	0.601445	0.398552403
188	2.4511E-06	0.599640811	0.400356738
188.5	2.3136E-06	0.597842026	0.40215566
189	2.1843E-06	0.596048629	0.403949186
189.5	2.0626E-06	0.594260605	0.405737332
190	1.948E-06	0.592477938	0.407520114
190.5	1.8401E-06	0.590700612	0.409297548
191	1.7384E-06	0.588928612	0.41106965
191.5	1.6427E-06	0.587161922	0.412836436
192	1.5525E-06	0.585400526	0.414597921
192.5	1.4676E-06	0.58364441	0.416354123
193	1.3875E-06	0.581893556	0.418105056
193.5	1.312E-06	0.580147951	0.419850737
194	1.2408E-06	0.578407579	0.421591181
194.5	1.1737E-06	0.576672423	0.423326403
195	1.1104E-06	0.574942469	0.425056421
195.5	1.0507E-06	0.573217701	0.426781248
196	9.9441E-07	0.571498104	0.428500901

196.5	9.4128E-07	0.569783663	0.430215395
197	8.9113E-07	0.568074362	0.431924746
197.5	8.438E-07	0.566370187	0.43362897
198	7.9911E-07	0.564671121	0.43532808
198.5	7.5692E-07	0.56297715	0.437022093
199	7.1708E-07	0.561288258	0.438711025
199.5	6.7945E-07	0.559604431	0.44039489
200	6.439E-07	0.557925653	0.442073703
200.5	6.1031E-07	0.55625191	0.44374748
201	5.7857E-07	0.554583186	0.445416236
201.5	5.4857E-07	0.552919466	0.447079985
202	5.2021E-07	0.551260736	0.448738744
202.5	4.9339E-07	0.549606981	0.450392526
203	4.6804E-07	0.547958185	0.452041347
203.5	4.4406E-07	0.546314335	0.453685221
204	4.2138E-07	0.544675414	0.455324164
204.5	3.9992E-07	0.54304141	0.456958191
205	3.7961E-07	0.541412306	0.458587315
205.5	3.6039E-07	0.539788088	0.460211552
206	3.4221E-07	0.538168742	0.461830916
206.5	3.2499E-07	0.536554253	0.463445422
207	3.0868E-07	0.534944606	0.465055085
207.5	2.9324E-07	0.533339788	0.466659919
208	2.7862E-07	0.531739783	0.468259938
208.5	2.6477E-07	0.530144578	0.469855157
209	2.5164E-07	0.528554157	0.471445591
209.5	2.3921E-07	0.526968507	0.473031254
210	2.2742E-07	0.525387613	0.474612159
210.5	2.1625E-07	0.523811462	0.476188322
211	2.0566E-07	0.522240038	0.477759756
211.5	1.9562E-07	0.520673328	0.479326477
212	1.8609E-07	0.519111317	0.480888497
212.5	1.7706E-07	0.517553992	0.48244583
213	1.6849E-07	0.516001339	0.483998492
213.5	1.6036E-07	0.514453343	0.485546496
214	1.5265E-07	0.512909991	0.487089857
214.5	1.4533E-07	0.511371268	0.488628586
215	1.3838E-07	0.509837161	0.4901627
215.5	1.3178E-07	0.508307656	0.491692212
216	1.2552E-07	0.50678274	0.493217135
216.5	1.1957E-07	0.505262397	0.494737483
217	1.1392E-07	0.503746616	0.49625327
217.5	1.0856E-07	0.502235381	0.49776451

218	1.0346E-07	0.50072868	0.499271216
218.5	9.8616E-08	0.499226499	0.500773402
219	9.4013E-08	0.497728824	0.502271082
219.5	8.9638E-08	0.496235642	0.503764268
220	8.5479E-08	0.494746939	0.505252975
220.5	8.1525E-08	0.493262703	0.506737216
221	7.7765E-08	0.491782918	0.508217004
221.5	7.4189E-08	0.490307573	0.509692353
222	7.0788E-08	0.488836654	0.511163275
222.5	6.7553E-08	0.487370147	0.512629785
223	6.4474E-08	0.48590804	0.514091896
223.5	6.1545E-08	0.484450318	0.51554962
224	5.8757E-08	0.48299697	0.517002971
224.5	5.6104E-08	0.481547982	0.518451962
225	5.3578E-08	0.480103341	0.519896606
225.5	5.1173E-08	0.478663033	0.521336916
226	4.8882E-08	0.477227046	0.522772905
226.5	4.6701E-08	0.475795367	0.524204586
227	4.4624E-08	0.474367983	0.525631972
227.5	4.2644E-08	0.472944881	0.527055076
228	4.0759E-08	0.471526048	0.528473911
228.5	3.8962E-08	0.470111472	0.529888489
229	3.7249E-08	0.468701139	0.531298823
229.5	3.5617E-08	0.467295038	0.532704927
230	3.4061E-08	0.465893154	0.534106812
230.5	3.2577E-08	0.464495476	0.535504491
231	3.1162E-08	0.463101991	0.536897978
231.5	2.9813E-08	0.461712686	0.538287284
232	2.8526E-08	0.46032755	0.539672422
232.5	2.7298E-08	0.458946568	0.541053404
233	2.6127E-08	0.45756973	0.542430244
233.5	2.5009E-08	0.456197022	0.543802953
234	2.3942E-08	0.454828432	0.545171544
234.5	2.2924E-08	0.453463947	0.54653603
235	2.1952E-08	0.452103557	0.547896422
235.5	2.1024E-08	0.450747247	0.549252732
236	2.0138E-08	0.449395006	0.550604974
236.5	1.9292E-08	0.448046822	0.551953159
237	1.8484E-08	0.446702682	0.553297299
237.5	1.7712E-08	0.445362575	0.554637407
238	1.6974E-08	0.444026488	0.555973495
238.5	1.6269E-08	0.442694409	0.557305575
239	1.5596E-08	0.441366327	0.558633658

239.5	1.4952E-08	0.440042228	0.559957757
240	1.4337E-08	0.438722102	0.561277884
240.5	1.3749E-08	0.437405936	0.56259405
241	1.3187E-08	0.436093719	0.563906268
241.5	1.2649E-08	0.434785439	0.565214549
242	1.2135E-08	0.433481083	0.566518905
242.5	1.1643E-08	0.43218064	0.567819348
243	1.1172E-08	0.430884099	0.56911589
243.5	1.0722E-08	0.429591447	0.570408543
244	1.0292E-08	0.428302673	0.571697317
244.5	9.8796E-09	0.427017765	0.572982225
245	9.4851E-09	0.425736712	0.574263278
245.5	9.1075E-09	0.424459502	0.575540488
246	8.7461E-09	0.423186124	0.576813867
246.5	8.4E-09	0.421916566	0.578083425
247	8.0686E-09	0.420650817	0.579349175
247.5	7.7513E-09	0.419388865	0.580611127
248	7.4473E-09	0.418130699	0.581869294
248.5	7.1562E-09	0.416876307	0.583123686
249	6.8773E-09	0.415625678	0.584374315
249.5	6.61E-09	0.414378801	0.585621192
250	6.3539E-09	0.413135665	0.586864328
250.5	6.1085E-09	0.411896258	0.588103735
251	5.8732E-09	0.41066057	0.589339424
251.5	5.6477E-09	0.409428588	0.590571406
252	5.4315E-09	0.408200303	0.591799692
252.5	5.2242E-09	0.406975702	0.593024293
253	5.0254E-09	0.405754775	0.59424522
253.5	4.8347E-09	0.404537511	0.595462484
254	4.6519E-09	0.403323899	0.596676097
254.5	4.4765E-09	0.402113927	0.597886068
255	4.3081E-09	0.400907586	0.59909241
255.5	4.1467E-09	0.399704863	0.600295133
256	3.9917E-09	0.398505749	0.601494247
256.5	3.843E-09	0.397310231	0.602689765
257	3.7002E-09	0.396118301	0.603881695
257.5	3.5632E-09	0.394929946	0.60507005
258	3.4316E-09	0.393745156	0.60625484
258.5	3.3052E-09	0.392563921	0.607436076
259	3.1839E-09	0.391386229	0.608613767
259.5	3.0674E-09	0.390212071	0.609787926
260	2.9555E-09	0.389041435	0.610958562
260.5	2.848E-09	0.387874311	0.612125687

261	2.7447E-09	0.386710688	0.613289309
261.5	2.6455E-09	0.385550556	0.614449442
262	2.5501E-09	0.384393904	0.615606093
262.5	2.4584E-09	0.383240723	0.616759275
263	2.3704E-09	0.382091001	0.617908997
263.5	2.2857E-09	0.380944728	0.61905527
264	2.2043E-09	0.379801894	0.620198104
264.5	2.126E-09	0.378662488	0.62133751
265	2.0507E-09	0.377526501	0.622473497
265.5	1.9783E-09	0.376393921	0.623606077
266	1.9087E-09	0.375264739	0.624735259
266.5	1.8417E-09	0.374138945	0.625861053
267	1.7773E-09	0.373016528	0.62698347
267.5	1.7153E-09	0.371897479	0.628102519
268	1.6557E-09	0.370781787	0.629218212
268.5	1.5983E-09	0.369669441	0.630330557
269	1.543E-09	0.368560433	0.631439565
269.5	1.4899E-09	0.367454752	0.632545247
270	1.4387E-09	0.366352388	0.633647611
270.5	1.3894E-09	0.36525333	0.634746668
271	1.3419E-09	0.364157571	0.635842428
271.5	1.2962E-09	0.363065098	0.636934901
272	1.2522E-09	0.361975903	0.638024096
272.5	1.2099E-09	0.360889975	0.639110024
273	1.169E-09	0.359807305	0.640192694
273.5	1.1297E-09	0.358727883	0.641272116
274	1.0918E-09	0.3576517	0.642348299
274.5	1.0553E-09	0.356578744	0.643421254
275	1.0201E-09	0.355509008	0.644490991
275.5	9.8621E-10	0.354442481	0.645557518
276	9.5353E-10	0.353379154	0.646620845
276.5	9.2202E-10	0.352319016	0.647680983
277	8.9165E-10	0.351262059	0.64873794
277.5	8.6237E-10	0.350208273	0.649791726
278	8.3413E-10	0.349157649	0.650842351
278.5	8.069E-10	0.348110176	0.651889824
279	7.8063E-10	0.347065845	0.652934154
279.5	7.553E-10	0.346024648	0.653975352
280	7.3087E-10	0.344986574	0.655013426
280.5	7.0729E-10	0.343951614	0.656048385
281	6.8454E-10	0.342919759	0.65708024
281.5	6.626E-10	0.341891	0.658108999
282	6.4141E-10	0.340865327	0.659134672

282.5	6.2097E-10	0.339842731	0.660157268
283	6.0124E-10	0.338823203	0.661176797
283.5	5.8219E-10	0.337806733	0.662193266
284	5.638E-10	0.336793313	0.663206686
284.5	5.4605E-10	0.335782933	0.664217066
285	5.2891E-10	0.334775584	0.665224415
285.5	5.1235E-10	0.333771258	0.666228742
286	4.9636E-10	0.332769944	0.667230056
286.5	4.8092E-10	0.331771634	0.668228366
287	4.66E-10	0.330776319	0.66922368
287.5	4.5159E-10	0.32978399	0.670216009
288	4.3766E-10	0.328794638	0.671205361
288.5	4.2421E-10	0.327808254	0.672191745
289	4.1121E-10	0.32682483	0.67317517
289.5	3.9864E-10	0.325844355	0.674155645
290	3.865E-10	0.324866822	0.675133178
290.5	3.7476E-10	0.323892222	0.676107778
291	3.6341E-10	0.322920545	0.677079455
291.5	3.5243E-10	0.321951783	0.678048216
292	3.4182E-10	0.320985928	0.679014072
292.5	3.3157E-10	0.32002297	0.679977029
293	3.2164E-10	0.319062901	0.680937098
293.5	3.1205E-10	0.318105713	0.681894287
294	3.0277E-10	0.317151395	0.682848604
294.5	2.9379E-10	0.316199941	0.683800058
295	2.851E-10	0.315251341	0.684748658
295.5	2.767E-10	0.314305587	0.685694412
296	2.6857E-10	0.313362671	0.686637329
296.5	2.607E-10	0.312422583	0.687577417
297	2.5308E-10	0.311485315	0.688514685
297.5	2.4571E-10	0.310550859	0.689449141
298	2.3858E-10	0.309619206	0.690380793
298.5	2.3167E-10	0.308690349	0.691309651
299	2.2499E-10	0.307764278	0.692235722
299.5	2.1851E-10	0.306840985	0.693159015
300	2.1224E-10	0.305920462	0.694079538
300.5	2.0617E-10	0.305002701	0.694997299
301	2.0029E-10	0.304087693	0.695912307
301.5	1.946E-10	0.303175429	0.69682457
302	1.8908E-10	0.302265903	0.697734097
302.5	1.8374E-10	0.301359105	0.698640894
303	1.7856E-10	0.300455028	0.699544972
303.5	1.7354E-10	0.299553663	0.700446337

304	1.6868E-10	0.298655002	0.701344998
304.5	1.6397E-10	0.297759037	0.702240963
305	1.5941E-10	0.29686576	0.70313424
305.5	1.5498E-10	0.295975163	0.704024837
306	1.5069E-10	0.295087237	0.704912763
306.5	1.4654E-10	0.294201976	0.705798024
307	1.4251E-10	0.29331937	0.70668063
307.5	1.386E-10	0.292439412	0.707560588
308	1.3481E-10	0.291562093	0.708437907
308.5	1.3113E-10	0.290687407	0.709312593
309	1.2757E-10	0.289815345	0.710184655
309.5	1.2411E-10	0.288945899	0.711054101
310	1.2076E-10	0.288079061	0.711920939
310.5	1.1751E-10	0.287214824	0.712785176
311	1.1435E-10	0.286353179	0.71364682
311.5	1.1129E-10	0.28549412	0.71450588
312	1.0832E-10	0.284637638	0.715362362
312.5	1.0544E-10	0.283783725	0.716216275
313	1.0264E-10	0.282932373	0.717067626
313.5	9.9923E-11	0.282083576	0.717916424
314	9.7287E-11	0.281237326	0.718762674
314.5	9.4729E-11	0.280393614	0.719606386
315	9.2245E-11	0.279552433	0.720447567
315.5	8.9834E-11	0.278713775	0.721286224
316	8.7493E-11	0.277877634	0.722122366
316.5	8.522E-11	0.277044001	0.722955999
317	8.3012E-11	0.276212869	0.723787131
317.5	8.0869E-11	0.275384231	0.724615769
318	7.8786E-11	0.274558078	0.725441922
318.5	7.6764E-11	0.273734404	0.726265596
319	7.4799E-11	0.272913201	0.727086799
319.5	7.289E-11	0.272094461	0.727905539
320	7.1036E-11	0.271278178	0.728721822
320.5	6.9234E-11	0.270464343	0.729535657
321	6.7483E-11	0.26965295	0.73034705
321.5	6.5782E-11	0.268843991	0.731156009
322	6.4128E-11	0.268037459	0.731962541
322.5	6.2521E-11	0.267233347	0.732766653
323	6.0959E-11	0.266431647	0.733568353
323.5	5.9441E-11	0.265632352	0.734367648
324	5.7964E-11	0.264835455	0.735164545
324.5	5.6529E-11	0.264040948	0.735959052
325	5.5133E-11	0.263248826	0.736751174

325.5	5.3776E-11	0.262459079	0.737540921
326	5.2457E-11	0.261671702	0.738328298
326.5	5.1173E-11	0.260886687	0.739113313
327	4.9925E-11	0.260104027	0.739895973
327.5	4.8711E-11	0.259323715	0.740676285
328	4.753E-11	0.258545743	0.741454257
328.5	4.6381E-11	0.257770106	0.742229894
329	4.5263E-11	0.256996796	0.743003204
329.5	4.4175E-11	0.256225806	0.743774194
330	4.3117E-11	0.255457128	0.744542872
330.5	4.2087E-11	0.254690757	0.745309243
331	4.1085E-11	0.253926684	0.746073316
331.5	4.0109E-11	0.253164904	0.746835096
332	3.916E-11	0.25240541	0.74759459
332.5	3.8236E-11	0.251648193	0.748351807
333	3.7336E-11	0.250893249	0.749106751
333.5	3.646E-11	0.250140569	0.749859431
334	3.5608E-11	0.249390147	0.750609853
334.5	3.4777E-11	0.248641977	0.751358023
335	3.3969E-11	0.247896051	0.752103949
335.5	3.3181E-11	0.247152363	0.752847637
336	3.2415E-11	0.246410906	0.753589094
336.5	3.1668E-11	0.245671673	0.754328327
337	3.094E-11	0.244934658	0.755065342
337.5	3.0232E-11	0.244199854	0.755800146
338	2.9542E-11	0.243467255	0.756532745
338.5	2.8869E-11	0.242736853	0.757263147
339	2.8214E-11	0.242008642	0.757991358
339.5	2.7575E-11	0.241282616	0.758717384
340	2.6953E-11	0.240558768	0.759441232
340.5	2.6347E-11	0.239837092	0.760162908
341	2.5756E-11	0.239117581	0.760882419
341.5	2.518E-11	0.238400228	0.761599772
342	2.4619E-11	0.237685027	0.762314973
342.5	2.4072E-11	0.236971972	0.763028028
343	2.3539E-11	0.236261056	0.763738944
343.5	2.3019E-11	0.235552273	0.764447727
344	2.2512E-11	0.234845616	0.765154384
344.5	2.2017E-11	0.23414108	0.76585892
345	2.1535E-11	0.233438656	0.766561344
345.5	2.1065E-11	0.23273834	0.76726166
346	2.0607E-11	0.232040125	0.767959875
346.5	2.016E-11	0.231344005	0.768655995

347	1.9724E-11	0.230649973	0.769350027
347.5	1.9298E-11	0.229958023	0.770041977
348	1.8883E-11	0.229268149	0.770731851
348.5	1.8479E-11	0.228580345	0.771419655
349	1.8084E-11	0.227894604	0.772105396
349.5	1.7698E-11	0.22721092	0.77278908
350	1.7322E-11	0.226529287	0.773470713
350.5	1.6956E-11	0.225849699	0.774150301
351	1.6597E-11	0.22517215	0.77482785
351.5	1.6248E-11	0.224496634	0.775503366
352	1.5907E-11	0.223823144	0.776176856
352.5	1.5574E-11	0.223151674	0.776848326
353	1.5249E-11	0.222482219	0.777517781
353.5	1.4932E-11	0.221814773	0.778185227
354	1.4622E-11	0.221149328	0.778850672
354.5	1.432E-11	0.22048588	0.77951412
355	1.4025E-11	0.219824423	0.780175577
355.5	1.3736E-11	0.219164949	0.780835051
356	1.3455E-11	0.218507454	0.781492546
356.5	1.318E-11	0.217851932	0.782148068
357	1.2912E-11	0.217198376	0.782801624
357.5	1.2649E-11	0.216546781	0.783453219
358	1.2393E-11	0.215897141	0.784102859
358.5	1.2143E-11	0.215249449	0.784750551
359	1.1899E-11	0.214603701	0.785396299
359.5	1.166E-11	0.21395989	0.78604011
360	1.1427E-11	0.21331801	0.78668199
360.5	1.1199E-11	0.212678056	0.787321944
361	1.0976E-11	0.212040022	0.787959978
361.5	1.0758E-11	0.211403902	0.788596098
362	1.0546E-11	0.21076969	0.78923031
362.5	1.0338E-11	0.210137381	0.789862619
363	1.0135E-11	0.209506969	0.790493031
363.5	9.9364E-12	0.208878448	0.791121552
364	9.7423E-12	0.208251813	0.791748187
364.5	9.5526E-12	0.207627057	0.792372943
365	9.3672E-12	0.207004176	0.792995824
365.5	9.1859E-12	0.206383164	0.793616836
366	9.0086E-12	0.205764014	0.794235986
366.5	8.8353E-12	0.205146722	0.794853278
367	8.6658E-12	0.204531282	0.795468718
367.5	8.5001E-12	0.203917688	0.796082312
368	8.338E-12	0.203305935	0.796694065

368.5	8.1795E-12	0.202696017	0.797303983
369	8.0245E-12	0.202087929	0.797912071
369.5	7.8729E-12	0.201481665	0.798518335
370	7.7246E-12	0.20087722	0.79912278
370.5	7.5795E-12	0.200274589	0.799725411
371	7.4376E-12	0.199673765	0.800326235
371.5	7.2987E-12	0.199074744	0.800925256
372	7.1628E-12	0.19847752	0.80152248
372.5	7.0299E-12	0.197882087	0.802117913
373	6.8998E-12	0.197288441	0.802711559
373.5	6.7726E-12	0.196696575	0.803303425
374	6.648E-12	0.196106486	0.803893514
374.5	6.5261E-12	0.195518166	0.804481834
375	6.4068E-12	0.194931612	0.805068388
375.5	6.29E-12	0.194346817	0.805653183
376	6.1757E-12	0.193763776	0.806236224
376.5	6.0639E-12	0.193182485	0.806817515
377	5.9543E-12	0.192602938	0.807397062
377.5	5.8471E-12	0.192025129	0.807974871
378	5.7421E-12	0.191449053	0.808550947
378.5	5.6393E-12	0.190874706	0.809125294
379	5.5387E-12	0.190302082	0.809697918
379.5	5.4401E-12	0.189731176	0.810268824
380	5.3436E-12	0.189161982	0.810838018
380.5	5.2491E-12	0.188594496	0.811405504
381	5.1566E-12	0.188028713	0.811971287
381.5	5.0659E-12	0.187464627	0.812535373
382	4.9771E-12	0.186902233	0.813097767
382.5	4.8901E-12	0.186341526	0.813658474
383	4.8049E-12	0.185782502	0.814217498
383.5	4.7215E-12	0.185225154	0.814774846
384	4.6397E-12	0.184669479	0.815330521
384.5	4.5596E-12	0.18411547	0.81588453
385	4.4811E-12	0.183563124	0.816436876
385.5	4.4042E-12	0.183012434	0.816987566
386	4.3288E-12	0.182463397	0.817536603
386.5	4.255E-12	0.181916007	0.818083993
387	4.1826E-12	0.181370259	0.818629741
387.5	4.1117E-12	0.180826148	0.819173852
388	4.0422E-12	0.18028367	0.81971633
388.5	3.974E-12	0.179742819	0.820257181
389	3.9072E-12	0.17920359	0.82079641
389.5	3.8418E-12	0.178665979	0.821334021

390	3.7776E-12	0.178129982	0.821870018
390.5	3.7147E-12	0.177595592	0.822404408
391	3.653E-12	0.177062805	0.822937195
391.5	3.5925E-12	0.176531616	0.823468384
392	3.5332E-12	0.176002022	0.823997978
392.5	3.4751E-12	0.175474016	0.824525984
393	3.4181E-12	0.174947593	0.825052407
393.5	3.3621E-12	0.174422751	0.825577249
394	3.3073E-12	0.173899482	0.826100518
394.5	3.2535E-12	0.173377784	0.826622216
395	3.2008E-12	0.172857651	0.827142349
395.5	3.1491E-12	0.172339078	0.827660922
396	3.0983E-12	0.17182206	0.82817794
396.5	3.0485E-12	0.171306594	0.828693406
397	2.9997E-12	0.170792674	0.829207326
397.5	2.9518E-12	0.170280296	0.829719704
398	2.9048E-12	0.169769456	0.830230544
398.5	2.8587E-12	0.169260147	0.830739853
399	2.8135E-12	0.168752367	0.831247633
399.5	2.7691E-12	0.16824611	0.83175389
400	2.7255E-12	0.167741371	0.832258629
400.5	2.6828E-12	0.167238147	0.832761853
401	2.6408E-12	0.166736433	0.833263567
401.5	2.5996E-12	0.166236223	0.833763777
402	2.5592E-12	0.165737515	0.834262485
402.5	2.5196E-12	0.165240302	0.834759698
403	2.4807E-12	0.164744581	0.835255419
403.5	2.4424E-12	0.164250348	0.835749652
404	2.4049E-12	0.163757597	0.836242403
404.5	2.3681E-12	0.163266324	0.836733676
405	2.332E-12	0.162776525	0.837223475
405.5	2.2965E-12	0.162288195	0.837711805
406	2.2616E-12	0.161801331	0.838198669
406.5	2.2274E-12	0.161315927	0.838684073
407	2.1938E-12	0.160831979	0.839168021
407.5	2.1608E-12	0.160349483	0.839650517
408	2.1284E-12	0.159868434	0.840131566
408.5	2.0966E-12	0.159388829	0.840611171
409	2.0654E-12	0.158910663	0.841089337
409.5	2.0347E-12	0.158433931	0.841566069
410	2.0045E-12	0.157958629	0.842041371
410.5	1.9749E-12	0.157484753	0.842515247
411	1.9458E-12	0.157012299	0.842987701

411.5	1.9173E-12	0.156541262	0.843458738
412	1.8892E-12	0.156071638	0.843928362
412.5	1.8617E-12	0.155603423	0.844396577
413	1.8346E-12	0.155136613	0.844863387
413.5	1.808E-12	0.154671203	0.845328797
414	1.7818E-12	0.154207189	0.845792811
414.5	1.7561E-12	0.153744568	0.846255432
415	1.7309E-12	0.153283334	0.846716666
415.5	1.7061E-12	0.152823484	0.847176516
416	1.6817E-12	0.152365014	0.847634986
416.5	1.6577E-12	0.151907919	0.848092081
417	1.6342E-12	0.151452195	0.848547805
417.5	1.611E-12	0.150997838	0.849002162
418	1.5883E-12	0.150544845	0.849455155
418.5	1.5659E-12	0.15009321	0.84990679
419	1.544E-12	0.149642931	0.850357069
419.5	1.5224E-12	0.149194002	0.850805998
420	1.5011E-12	0.14874642	0.85125358
420.5	1.4802E-12	0.148300181	0.851699819
421	1.4597E-12	0.14785528	0.85214472
421.5	1.4395E-12	0.147411714	0.852588286
422	1.4197E-12	0.146969479	0.853030521
422.5	1.4002E-12	0.146528571	0.853471429
423	1.381E-12	0.146088985	0.853911015
423.5	1.3621E-12	0.145650718	0.854349282
424	1.3436E-12	0.145213766	0.854786234
424.5	1.3254E-12	0.144778125	0.855221875
425	1.3074E-12	0.14434379	0.85565621
425.5	1.2898E-12	0.143910759	0.856089241
426	1.2724E-12	0.143479027	0.856520973
426.5	1.2553E-12	0.143048589	0.856951411
427	1.2386E-12	0.142619444	0.857380556
427.5	1.222E-12	0.142191585	0.857808415
428	1.2058E-12	0.141765011	0.858234989
428.5	1.1898E-12	0.141339716	0.858660284
429	1.1741E-12	0.140915696	0.859084304
429.5	1.1586E-12	0.140492949	0.859507051
430	1.1434E-12	0.14007147	0.85992853
430.5	1.1284E-12	0.139651256	0.860348744
431	1.1137E-12	0.139232302	0.860767698
431.5	1.0992E-12	0.138814605	0.861185395
432	1.0849E-12	0.138398162	0.861601838
432.5	1.0709E-12	0.137982967	0.862017033

433	1.0571E-12	0.137569018	0.862430982
433.5	1.0435E-12	0.137156311	0.862843689
434	1.0301E-12	0.136744842	0.863255158
434.5	1.0169E-12	0.136334608	0.863665392
435	1.004E-12	0.135925604	0.864074396
435.5	9.912E-13	0.135517827	0.864482173
436	9.7864E-13	0.135111274	0.864888726
436.5	9.6627E-13	0.13470594	0.86529406
437	9.541E-13	0.134301822	0.865698178
437.5	9.4212E-13	0.133898916	0.866101084
438	9.3033E-13	0.13349722	0.86650278
438.5	9.1871E-13	0.133096728	0.866903272
439	9.0728E-13	0.132697438	0.867302562
439.5	8.9603E-13	0.132299346	0.867700654
440	8.8494E-13	0.131902447	0.868097553
440.5	8.7403E-13	0.13150674	0.86849326
441	8.6328E-13	0.13111222	0.86888778
441.5	8.527E-13	0.130718883	0.869281117
442	8.4228E-13	0.130326727	0.869673273
442.5	8.3201E-13	0.129935746	0.870064254
443	8.219E-13	0.129545939	0.870454061
443.5	8.1195E-13	0.129157301	0.870842699
444	8.0214E-13	0.128769829	0.871230171
444.5	7.9249E-13	0.12838352	0.87161648
445	7.8297E-13	0.127998369	0.872001631
445.5	7.736E-13	0.127614374	0.872385626
446	7.6437E-13	0.127231531	0.872768469
446.5	7.5528E-13	0.126849837	0.873150163
447	7.4632E-13	0.126469287	0.873530713
447.5	7.375E-13	0.126089879	0.873910121
448	7.288E-13	0.12571161	0.87428839
448.5	7.2023E-13	0.125334475	0.874665525
449	7.1179E-13	0.124958471	0.875041529
449.5	7.0348E-13	0.124583596	0.875416404
450	6.9528E-13	0.124209845	0.875790155
450.5	6.8721E-13	0.123837216	0.876162784
451	6.7925E-13	0.123465704	0.876534296
451.5	6.7141E-13	0.123095307	0.876904693
452	6.6368E-13	0.122726021	0.877273979
452.5	6.5607E-13	0.122357843	0.877642157
453	6.4856E-13	0.121990769	0.878009231
453.5	6.4116E-13	0.121624797	0.878375203
454	6.3387E-13	0.121259923	0.878740077

454.5	6.2669E-13	0.120896143	0.879103857
455	6.196E-13	0.120533454	0.879466546
455.5	6.1262E-13	0.120171854	0.879828146
456	6.0574E-13	0.119811339	0.880188661
456.5	5.9895E-13	0.119451904	0.880548096
457	5.9226E-13	0.119093549	0.880906451
457.5	5.8567E-13	0.118736268	0.881263732
458	5.7916E-13	0.118380059	0.881619941
458.5	5.7275E-13	0.118024919	0.881975081
459	5.6643E-13	0.117670844	0.882329156
459.5	5.602E-13	0.117317832	0.882682168
460	5.5406E-13	0.116965878	0.883034122
460.5	5.48E-13	0.116614981	0.883385019
461	5.4202E-13	0.116265136	0.883734864
461.5	5.3613E-13	0.11591634	0.88408366
462	5.3032E-13	0.115568591	0.884431409
462.5	5.2459E-13	0.115221886	0.884778114
463	5.1894E-13	0.11487622	0.88512378
463.5	5.1336E-13	0.114531591	0.885468409
464	5.0786E-13	0.114187997	0.885812003
464.5	5.0244E-13	0.113845433	0.886154567
465	4.9709E-13	0.113503896	0.886496104
465.5	4.9182E-13	0.113163385	0.886836615
466	4.8662E-13	0.112823894	0.887176106
466.5	4.8148E-13	0.112485423	0.887514577
467	4.7642E-13	0.112147966	0.887852034
467.5	4.7142E-13	0.111811523	0.888188477
468	4.6649E-13	0.111476088	0.888523912
468.5	4.6163E-13	0.11114166	0.88885834
469	4.5683E-13	0.110808235	0.889191765
469.5	4.521E-13	0.11047581	0.88952419
470	4.4743E-13	0.110144383	0.889855617
470.5	4.4282E-13	0.109813949	0.890186051
471	4.3828E-13	0.109484508	0.890515492
471.5	4.3379E-13	0.109156054	0.890843946
472	4.2936E-13	0.108828586	0.891171414
472.5	4.2499E-13	0.1085021	0.8914979
473	4.2068E-13	0.108176594	0.891823406
473.5	4.1643E-13	0.107852064	0.892147936
474	4.1223E-13	0.107528508	0.892471492
474.5	4.0808E-13	0.107205922	0.892794078
475	4.0399E-13	0.106884305	0.893115695
475.5	3.9996E-13	0.106563652	0.893436348

476	3.9597E-13	0.106243961	0.893756039
476.5	3.9204E-13	0.105925229	0.894074771
477	3.8815E-13	0.105607453	0.894392547
477.5	3.8432E-13	0.105290631	0.894709369
478	3.8054E-13	0.104974759	0.895025241
478.5	3.768E-13	0.104659835	0.895340165
479	3.7312E-13	0.104345855	0.895654145
479.5	3.6948E-13	0.104032818	0.895967182
480	3.6588E-13	0.103720719	0.896279281
480.5	3.6233E-13	0.103409557	0.896590443
481	3.5883E-13	0.103099328	0.896900672
481.5	3.5537E-13	0.10279003	0.89720997
482	3.5196E-13	0.10248166	0.89751834
482.5	3.4858E-13	0.102174215	0.897825785
483	3.4525E-13	0.101867693	0.898132307
483.5	3.4196E-13	0.101562089	0.898437911
484	3.3872E-13	0.101257403	0.898742597
484.5	3.3551E-13	0.100953631	0.899046369
485	3.3234E-13	0.10065077	0.89934923
485.5	3.2922E-13	0.100348818	0.899651182
486	3.2613E-13	0.100047771	0.899952229
486.5	3.2308E-13	0.099747628	0.900252372
487	3.2006E-13	0.099448385	0.900551615
487.5	3.1709E-13	0.09915004	0.90084996
488	3.1415E-13	0.09885259	0.90114741
488.5	3.1124E-13	0.098556032	0.901443968
489	3.0838E-13	0.098260364	0.901739636
489.5	3.0554E-13	0.097965583	0.902034417
490	3.0274E-13	0.097671686	0.902328314
490.5	2.9998E-13	0.097378671	0.902621329
491	2.9725E-13	0.097086535	0.902913465
491.5	2.9455E-13	0.096795275	0.903204725
492	2.9188E-13	0.09650489	0.90349511
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493	2.8665E-13	0.095926729	0.904073271
493.5	2.8408E-13	0.095638949	0.904361051
494	2.8154E-13	0.095352032	0.904647968
494.5	2.7903E-13	0.095065976	0.904934024
495	2.7655E-13	0.094780778	0.905219222
495.5	2.741E-13	0.094496435	0.905503565
496	2.7167E-13	0.094212946	0.905787054
496.5	2.6928E-13	0.093930307	0.906069693
497	2.6692E-13	0.093648516	0.906351484

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498	2.6227E-13	0.093087468	0.906912532
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501	2.4897E-13	0.09142441	0.90857559
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502	2.4473E-13	0.090876687	0.909123313
502.5	2.4265E-13	0.090604057	0.909395943
503	2.406E-13	0.090332245	0.909667755
503.5	2.3857E-13	0.090061248	0.909938752
504	2.3656E-13	0.089791064	0.910208936
504.5	2.3457E-13	0.089521691	0.910478309
505	2.3261E-13	0.089253126	0.910746874
505.5	2.3067E-13	0.088985366	0.911014634
506	2.2875E-13	0.08871841	0.91128159
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507	2.2497E-13	0.088186898	0.911813102
507.5	2.2312E-13	0.087922338	0.912077662
508	2.2128E-13	0.087658571	0.912341429
508.5	2.1947E-13	0.087395595	0.912604405
509	2.1768E-13	0.087133408	0.912866592
509.5	2.159E-13	0.086872008	0.913127992
510	2.1415E-13	0.086611392	0.913388608
510.5	2.1242E-13	0.086351558	0.913648442
511	2.107E-13	0.086092503	0.913907497
511.5	2.0901E-13	0.085834225	0.914165775
512	2.0733E-13	0.085576723	0.914423277
512.5	2.0567E-13	0.085319993	0.914680007
513	2.0403E-13	0.085064033	0.914935967
513.5	2.0241E-13	0.084808841	0.915191159
514	2.008E-13	0.084554414	0.915445586
514.5	1.9921E-13	0.084300751	0.915699249
515	1.9764E-13	0.084047849	0.915952151
515.5	1.9609E-13	0.083795705	0.916204295
516	1.9455E-13	0.083544318	0.916455682
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517	1.9153E-13	0.083043804	0.916956196
517.5	1.9004E-13	0.082794672	0.917205328
518	1.8857E-13	0.082546288	0.917453712
518.5	1.8712E-13	0.08229865	0.91770135

519	1.8568E-13	0.082051754	0.917948246
519.5	1.8425E-13	0.081805598	0.918194402
520	1.8284E-13	0.081560182	0.918439818
520.5	1.8145E-13	0.081315501	0.918684499
521	1.8007E-13	0.081071555	0.918928445
521.5	1.787E-13	0.08082834	0.91917166
522	1.7735E-13	0.080585855	0.919414145
522.5	1.7602E-13	0.080344097	0.919655903
523	1.7469E-13	0.080103065	0.919896935
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524	1.7209E-13	0.079623168	0.920376832
524.5	1.7081E-13	0.079384298	0.920615702
525	1.6954E-13	0.079146145	0.920853855
525.5	1.6829E-13	0.078908707	0.921091293
526	1.6705E-13	0.078671981	0.921328019
526.5	1.6582E-13	0.078435965	0.921564035
527	1.646E-13	0.078200657	0.921799343
527.5	1.634E-13	0.077966055	0.922033945
528	1.6221E-13	0.077732157	0.922267843
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529	1.5986E-13	0.077266463	0.922733537
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530	1.5756E-13	0.07680356	0.92319644
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531	1.5531E-13	0.07634343	0.92365657
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532	1.5311E-13	0.075886056	0.924113944
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533	1.5094E-13	0.075431423	0.924568577
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534	1.4883E-13	0.074979513	0.925020487
534.5	1.4778E-13	0.074754575	0.925245425
535	1.4675E-13	0.074530311	0.925469689
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536	1.4471E-13	0.0740838	0.9259162
536.5	1.4371E-13	0.073861548	0.926138452
537	1.4272E-13	0.073639964	0.926360036
537.5	1.4174E-13	0.073419044	0.926580956
538	1.4076E-13	0.073198787	0.926801213
538.5	1.398E-13	0.07297919	0.92702081
539	1.3885E-13	0.072760253	0.927239747
539.5	1.379E-13	0.072541972	0.927458028
540	1.3697E-13	0.072324346	0.927675654

540.5	1.3604E-13	0.072107373	0.927892627
541	1.3512E-13	0.071891051	0.928108949
541.5	1.3421E-13	0.071675378	0.928324622
542	1.3332E-13	0.071460352	0.928539648
542.5	1.3242E-13	0.071245971	0.928754029
543	1.3154E-13	0.071032233	0.928967767
543.5	1.3067E-13	0.070819136	0.929180864
544	1.298E-13	0.070606679	0.929393321
544.5	1.2895E-13	0.070394859	0.929605141
545	1.281E-13	0.070183674	0.929816326
545.5	1.2726E-13	0.069973123	0.930026877
546	1.2642E-13	0.069763204	0.930236796
546.5	1.256E-13	0.069553914	0.930446086
547	1.2478E-13	0.069345252	0.930654748
547.5	1.2397E-13	0.069137217	0.930862783
548	1.2317E-13	0.068929805	0.931070195
548.5	1.2238E-13	0.068723016	0.931276984
549	1.2159E-13	0.068516846	0.931483154
549.5	1.2081E-13	0.068311296	0.931688704
550	1.2004E-13	0.068106362	0.931893638
550.5	1.1928E-13	0.067902043	0.932097957
551	1.1852E-13	0.067698337	0.932301663
551.5	1.1777E-13	0.067495242	0.932504758
552	1.1703E-13	0.067292756	0.932707244
552.5	1.1629E-13	0.067090878	0.932909122
553	1.1556E-13	0.066889605	0.933110395
553.5	1.1484E-13	0.066688936	0.933311064
554	1.1412E-13	0.06648887	0.93351113
554.5	1.1341E-13	0.066289403	0.933710597
555	1.1271E-13	0.066090535	0.933909465
555.5	1.1201E-13	0.065892263	0.934107737
556	1.1132E-13	0.065694586	0.934305414
556.5	1.1064E-13	0.065497503	0.934502497
557	1.0996E-13	0.06530101	0.93469899
557.5	1.0929E-13	0.065105107	0.934894893
558	1.0863E-13	0.064909792	0.935090208
558.5	1.0797E-13	0.064715062	0.935284938
559	1.0731E-13	0.064520917	0.935479083
559.5	1.0667E-13	0.064327354	0.935672646
560	1.0602E-13	0.064134372	0.935865628
560.5	1.0539E-13	0.063941969	0.936058031
561	1.0476E-13	0.063750143	0.936249857
561.5	1.0413E-13	0.063558893	0.936441107

562	1.0351E-13	0.063368216	0.936631784
562.5	1.029E-13	0.063178112	0.936821888
563	1.0229E-13	0.062988577	0.937011423
563.5	1.0169E-13	0.062799612	0.937200388
564	1.0109E-13	0.062611213	0.937388787
564.5	1.005E-13	0.062423379	0.937576621
565	9.9915E-14	0.062236109	0.937763891
565.5	9.9334E-14	0.062049401	0.937950599
566	9.8758E-14	0.061863252	0.938136748
566.5	9.8186E-14	0.061677663	0.938322337
567	9.762E-14	0.06149263	0.93850737
567.5	9.7059E-14	0.061308152	0.938691848
568	9.6502E-14	0.061124227	0.938875773
568.5	9.5951E-14	0.060940855	0.939059145
569	9.5404E-14	0.060758032	0.939241968
569.5	9.4862E-14	0.060575758	0.939424242
570	9.4325E-14	0.060394031	0.939605969
570.5	9.3792E-14	0.060212849	0.939787151
571	9.3264E-14	0.06003221	0.93996779
571.5	9.2741E-14	0.059852113	0.940147887
572	9.2222E-14	0.059672557	0.940327443
572.5	9.1707E-14	0.059493539	0.940506461
573	9.1197E-14	0.059315059	0.940684941
573.5	9.0691E-14	0.059137114	0.940862886
574	9.019E-14	0.058959702	0.941040298
574.5	8.9693E-14	0.058782823	0.941217177
575	8.92E-14	0.058606475	0.941393525
575.5	8.8711E-14	0.058430655	0.941569345
576	8.8226E-14	0.058255363	0.941744637
576.5	8.7746E-14	0.058080597	0.941919403
577	8.7269E-14	0.057906355	0.942093645
577.5	8.6797E-14	0.057732636	0.942267364
578	8.6328E-14	0.057559438	0.942440562
578.5	8.5864E-14	0.05738676	0.94261324
579	8.5403E-14	0.0572146	0.9427854
579.5	8.4946E-14	0.057042956	0.942957044
580	8.4493E-14	0.056871827	0.943128173
580.5	8.4044E-14	0.056701212	0.943298788
581	8.3598E-14	0.056531108	0.943468892
581.5	8.3156E-14	0.056361515	0.943638485
582	8.2718E-14	0.05619243	0.94380757
582.5	8.2283E-14	0.056023853	0.943976147
583	8.1852E-14	0.055855781	0.944144219

583.5	8.1425E-14	0.055688214	0.944311786
584	8.1001E-14	0.055521149	0.944478851
584.5	8.058E-14	0.055354586	0.944645414
585	8.0163E-14	0.055188522	0.944811478
585.5	7.975E-14	0.055022957	0.944977043
586	7.9339E-14	0.054857888	0.945142112
586.5	7.8933E-14	0.054693314	0.945306686
587	7.8529E-14	0.054529234	0.945470766
587.5	7.8128E-14	0.054365646	0.945634354
588	7.7731E-14	0.054202549	0.945797451
588.5	7.7337E-14	0.054039942	0.945960058
589	7.6947E-14	0.053877822	0.946122178
589.5	7.6559E-14	0.053716189	0.946283811
590	7.6175E-14	0.053555504	0.94644496
590.5	7.5793E-14	0.053394375	0.946605625
591	7.5415E-14	0.053234192	0.946765808
591.5	7.5039E-14	0.053074489	0.946925511
592	7.4667E-14	0.052915266	0.947084734
592.5	7.4298E-14	0.05275652	0.94724348
593	7.3931E-14	0.05259825	0.94740175
593.5	7.3567E-14	0.052440456	0.947559544
594	7.3207E-14	0.052283134	0.947716866
594.5	7.2849E-14	0.052126285	0.947873715
595	7.2494E-14	0.051969906	0.948030094
595.5	7.2142E-14	0.051813996	0.948186004
596	7.1792E-14	0.051658554	0.948341446
596.5	7.1445E-14	0.051503579	0.948496421
597	7.1101E-14	0.051349068	0.948650932
597.5	7.076E-14	0.051195021	0.948804979
598	7.0421E-14	0.051041436	0.948958564
598.5	7.0085E-14	0.050888311	0.949111689
599	6.9752E-14	0.050735646	0.949264354
599.5	6.9421E-14	0.050583439	0.949416561
600	6.9092E-14	0.050431689	0.949568311
600.5	6.8767E-14	0.050280394	0.949719606
601	6.8443E-14	0.050129553	0.949870447
601.5	6.8123E-14	0.049979164	0.950020836
602	6.7804E-14	0.049829227	0.950170773
602.5	6.7488E-14	0.049679739	0.950320261
603	6.7175E-14	0.0495307	0.9504693
603.5	6.6864E-14	0.049382108	0.950617892
604	6.6555E-14	0.049233961	0.950766039
604.5	6.6249E-14	0.049086259	0.950913741

605	6.5945E-14	0.048939001	0.951060999
605.5	6.5643E-14	0.048792184	0.951207816
606	6.5343E-14	0.048645807	0.951354193
606.5	6.5046E-14	0.04849987	0.95150013
607	6.4751E-14	0.04835437	0.95164563
607.5	6.4458E-14	0.048209307	0.951790693
608	6.4168E-14	0.048064679	0.951935321
608.5	6.3879E-14	0.047920485	0.952079515
609	6.3593E-14	0.047776724	0.952223276
609.5	6.3309E-14	0.047633393	0.952366607
610	6.3027E-14	0.047490493	0.952509507
610.5	6.2747E-14	0.047348022	0.952651978
611	6.247E-14	0.047205978	0.952794022
611.5	6.2194E-14	0.04706436	0.95293564
612	6.192E-14	0.046923167	0.953076833
612.5	6.1648E-14	0.046782397	0.953217603
613	6.1379E-14	0.04664205	0.95335795
613.5	6.1111E-14	0.046502124	0.953497876
614	6.0845E-14	0.046362617	0.953637383
614.5	6.0582E-14	0.04622353	0.95377647
615	6.032E-14	0.046084859	0.953915141
615.5	6.006E-14	0.045946604	0.954053396
616	5.9802E-14	0.045808765	0.954191235
616.5	5.9546E-14	0.045671338	0.954328662
617	5.9292E-14	0.045534324	0.954465676
617.5	5.9039E-14	0.045397721	0.954602279
618	5.8788E-14	0.045261528	0.954738472
618.5	5.854E-14	0.045125744	0.954874256
619	5.8293E-14	0.044990366	0.955009634
619.5	5.8047E-14	0.044855395	0.955144605
620	5.7804E-14	0.044720829	0.955279171
620.5	5.7562E-14	0.044586667	0.955413333
621	5.7322E-14	0.044452907	0.955547093
621.5	5.7084E-14	0.044319548	0.955680452
622	5.6848E-14	0.044186589	0.955813411
622.5	5.6613E-14	0.044054029	0.955945971
623	5.638E-14	0.043921867	0.956078133
623.5	5.6148E-14	0.043790102	0.956209898
624	5.5918E-14	0.043658731	0.956341269
624.5	5.569E-14	0.043527755	0.956472245
625	5.5463E-14	0.043397172	0.956602828
625.5	5.5238E-14	0.04326698	0.95673302
626	5.5015E-14	0.04313718	0.95686282

626.5	5.4793E-14	0.043007768	0.956992232
627	5.4572E-14	0.042878745	0.957121255
627.5	5.4354E-14	0.042750108	0.957249892
628	5.4136E-14	0.042621858	0.957378142
628.5	5.3921E-14	0.042493993	0.957506007
629	5.3706E-14	0.042366511	0.957633489
629.5	5.3494E-14	0.042239411	0.957760589
630	5.3282E-14	0.042112693	0.957887307
630.5	5.3073E-14	0.041986355	0.958013645
631	5.2864E-14	0.041860396	0.958139604
631.5	5.2657E-14	0.041734814	0.958265186
632	5.2452E-14	0.04160961	0.95839039
632.5	5.2248E-14	0.041484781	0.958515219
633	5.2045E-14	0.041360327	0.958639673
633.5	5.1844E-14	0.041236246	0.958763754
634	5.1644E-14	0.041112537	0.958887463
634.5	5.1445E-14	0.0409892	0.9590108
635	5.1248E-14	0.040866232	0.959133768
635.5	5.1052E-14	0.040743633	0.959256367
636	5.0858E-14	0.040621402	0.959378598
636.5	5.0665E-14	0.040499538	0.959500462
637	5.0473E-14	0.04037804	0.95962196
637.5	5.0282E-14	0.040256905	0.959743095
638	5.0093E-14	0.040136135	0.959863865
638.5	4.9905E-14	0.040015726	0.959984274
639	4.9718E-14	0.039895679	0.960104321
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640	4.9349E-14	0.039656664	0.960343336
640.5	4.9166E-14	0.039537694	0.960462306
641	4.8984E-14	0.039419081	0.960580919
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642	4.8624E-14	0.039182921	0.960817079
642.5	4.8446E-14	0.039065373	0.960934627
643	4.8269E-14	0.038948176	0.961051824
643.5	4.8093E-14	0.038831332	0.961168668
644	4.7919E-14	0.038714838	0.961285162
644.5	4.7745E-14	0.038598693	0.961401307
645	4.7573E-14	0.038482897	0.961517103
645.5	4.7402E-14	0.038367449	0.961632551
646	4.7232E-14	0.038252346	0.961747654
646.5	4.7063E-14	0.038137589	0.961862411
647	4.6895E-14	0.038023176	0.961976824
647.5	4.6728E-14	0.037909107	0.962090893

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649	4.6235E-14	0.037568947	0.962431053
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650	4.5911E-14	0.037343872	0.962656128
650.5	4.5751E-14	0.03723184	0.96276816
651	4.5591E-14	0.037120145	0.962879855
651.5	4.5433E-14	0.037008784	0.962991216
652	4.5276E-14	0.036897758	0.963102242
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653	4.4964E-14	0.036676704	0.963323296
653.5	4.481E-14	0.036566673	0.963433327
654	4.4657E-14	0.036456973	0.963543027
654.5	4.4505E-14	0.036347602	0.963652398
655	4.4354E-14	0.03623856	0.96376144
655.5	4.4203E-14	0.036129844	0.963870156
656	4.4054E-14	0.036021454	0.963978546
656.5	4.3906E-14	0.03591339	0.96408661
657	4.3758E-14	0.03580565	0.96419435
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658	4.3466E-14	0.035591138	0.964408862
658.5	4.3321E-14	0.035484365	0.964515635
659	4.3178E-14	0.035377912	0.964622088
659.5	4.3035E-14	0.035271778	0.964728222
660	4.2893E-14	0.035165963	0.964834037
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661	4.2612E-14	0.034955283	0.965044717
661.5	4.2472E-14	0.034850418	0.965149582
662	4.2334E-14	0.034745866	0.965254134
662.5	4.2197E-14	0.034641629	0.965358371
663	4.206E-14	0.034537704	0.965462296
663.5	4.1924E-14	0.034434091	0.965565909
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665	4.1522E-14	0.034125113	0.965874887
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666	4.1257E-14	0.033920669	0.966079331
666.5	4.1127E-14	0.033818907	0.966181093
667	4.0997E-14	0.03371745	0.96628255
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668	4.0739E-14	0.033515449	0.966484551
668.5	4.0611E-14	0.033414903	0.966585097
669	4.0484E-14	0.033314658	0.966685342

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670	4.0233E-14	0.03311507	0.96688493
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671	3.9985E-14	0.032916678	0.967083322
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672	3.9739E-14	0.032719474	0.967280526
672.5	3.9618E-14	0.032621315	0.967378685
673	3.9497E-14	0.032523451	0.967476549
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674	3.9257E-14	0.032328603	0.967671397
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675	3.9021E-14	0.032134923	0.967865077
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676	3.8787E-14	0.031942402	0.968057598
676.5	3.8671E-14	0.031846575	0.968153425
677	3.8556E-14	0.031751036	0.968248964
677.5	3.8441E-14	0.031655782	0.968344218
678	3.8328E-14	0.031560815	0.968439185
678.5	3.8215E-14	0.031466133	0.968533867
679	3.8102E-14	0.031371734	0.968628266
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680	3.7879E-14	0.031183786	0.968816214
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681	3.7659E-14	0.030996964	0.969003036
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682	3.7441E-14	0.030811261	0.969188739
682.5	3.7333E-14	0.030718828	0.969281172
683	3.7226E-14	0.030626671	0.969373329
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684	3.7014E-14	0.030443187	0.969556813
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685	3.6804E-14	0.030260802	0.969739198
685.5	3.6699E-14	0.030170019	0.969829981
686	3.6596E-14	0.030079509	0.969920491
686.5	3.6493E-14	0.029989271	0.970010729
687	3.6391E-14	0.029899303	0.970100697
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688	3.6188E-14	0.029720176	0.970279824
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689	3.5987E-14	0.029542122	0.970457878
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692	3.5399E-14	0.029014336	0.970985664
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693	3.5208E-14	0.028840512	0.971159488
693.5	3.5113E-14	0.02875399	0.97124601
694	3.5018E-14	0.028667728	0.971332272
694.5	3.4925E-14	0.028581725	0.971418275
695	3.4831E-14	0.02849598	0.97150402
695.5	3.4738E-14	0.028410492	0.971589508
696	3.4646E-14	0.02832526	0.97167474
696.5	3.4554E-14	0.028240285	0.971759715
697	3.4463E-14	0.028155564	0.971844436
697.5	3.4372E-14	0.028071097	0.971928903
698	3.4282E-14	0.027986884	0.972013116
698.5	3.4193E-14	0.027902923	0.972097077
699	3.4103E-14	0.027819214	0.972180786
699.5	3.4015E-14	0.027735757	0.972264243
700	3.3926E-14	0.027652549	0.972347451
700.5	3.3839E-14	0.027569592	0.972430408
701	3.3751E-14	0.027486883	0.972513117
701.5	3.3665E-14	0.027404422	0.972595578
702	3.3578E-14	0.027322209	0.972677791
702.5	3.3493E-14	0.027240242	0.972759758
703	3.3407E-14	0.027158522	0.972841478
703.5	3.3323E-14	0.027077046	0.972922954
704	3.3238E-14	0.026995815	0.973004185
704.5	3.3154E-14	0.026914828	0.973085172
705	3.3071E-14	0.026834083	0.973165917
705.5	3.2988E-14	0.026753581	0.973246419
706	3.2905E-14	0.02667332	0.97332668
706.5	3.2823E-14	0.0265933	0.9734067
707	3.2742E-14	0.02651352	0.97348648
707.5	3.2661E-14	0.02643398	0.97356602
708	3.258E-14	0.026354678	0.973645322
708.5	3.25E-14	0.026275614	0.973724386
709	3.242E-14	0.026196787	0.973803213
709.5	3.234E-14	0.026118196	0.973881804
710	3.2261E-14	0.026039842	0.973960158
710.5	3.2183E-14	0.025961722	0.974038278
711	3.2105E-14	0.025883837	0.974116163
711.5	3.2027E-14	0.025806186	0.974193814
712	3.195E-14	0.025728767	0.974271233

712.5	3.1873E-14	0.025651581	0.974348419
713	3.1796E-14	0.025574626	0.974425374
713.5	3.172E-14	0.025497902	0.974502098
714	3.1645E-14	0.025421408	0.974578592
714.5	3.1569E-14	0.025345144	0.974654856
715	3.1495E-14	0.025269109	0.974730891
715.5	3.142E-14	0.025193301	0.974806699
716	3.1346E-14	0.025117722	0.974882278
716.5	3.1273E-14	0.025042368	0.974957632
717	3.1199E-14	0.024967241	0.975032759
717.5	3.1127E-14	0.02489234	0.97510766
718	3.1054E-14	0.024817663	0.975182337
718.5	3.0982E-14	0.02474321	0.97525679
719	3.091E-14	0.02466898	0.97533102
719.5	3.0839E-14	0.024594973	0.975405027
720	3.0768E-14	0.024521188	0.975478812
720.5	3.0698E-14	0.024447625	0.975552375
721	3.0627E-14	0.024374282	0.975625718
721.5	3.0558E-14	0.024301159	0.975698841
722	3.0488E-14	0.024228255	0.975771745
722.5	3.0419E-14	0.024155571	0.975844429
723	3.035E-14	0.024083104	0.975916896
723.5	3.0282E-14	0.024010855	0.975989145
724	3.0214E-14	0.023938822	0.976061178
724.5	3.0146E-14	0.023867006	0.976132994
725	3.0079E-14	0.023795404	0.976204596
725.5	3.0012E-14	0.023724018	0.976275982
726	2.9946E-14	0.023652846	0.976347154
726.5	2.9879E-14	0.023581888	0.976418112
727	2.9814E-14	0.023511142	0.976488858
727.5	2.9748E-14	0.023440609	0.976559391
728	2.9683E-14	0.023370287	0.976629713
728.5	2.9618E-14	0.023300176	0.976699824
729	2.9553E-14	0.023230275	0.976769725
729.5	2.9489E-14	0.023160585	0.976839415
730	2.9425E-14	0.023091103	0.976908897
730.5	2.9362E-14	0.023021829	0.976978171
731	2.9299E-14	0.022952764	0.977047236
731.5	2.9236E-14	0.022883906	0.977116094
732	2.9173E-14	0.022815254	0.977184746
732.5	2.9111E-14	0.022746808	0.977253192
733	2.9049E-14	0.022678568	0.977321432
733.5	2.8988E-14	0.022610532	0.977389468

734	2.8926E-14	0.022542701	0.977457299
734.5	2.8865E-14	0.022475072	0.977524928
735	2.8805E-14	0.022407647	0.977592353
735.5	2.8744E-14	0.022340424	0.977659576
736	2.8684E-14	0.022273403	0.977726597
736.5	2.8624E-14	0.022206583	0.977793417
737	2.8565E-14	0.022139963	0.977860037
737.5	2.8506E-14	0.022073543	0.977926457
738	2.8447E-14	0.022007323	0.977992677
738.5	2.8389E-14	0.021941301	0.978058699
739	2.833E-14	0.021875477	0.978124523
739.5	2.8272E-14	0.02180985	0.97819015
740	2.8215E-14	0.021744421	0.978255579
740.5	2.8157E-14	0.021679187	0.978320813
741	2.81E-14	0.02161415	0.97838585
741.5	2.8043E-14	0.021549307	0.978450693
742	2.7987E-14	0.021484659	0.978515341
742.5	2.7931E-14	0.021420205	0.978579795
743	2.7875E-14	0.021355945	0.978644055
743.5	2.7819E-14	0.021291877	0.978708123
744	2.7764E-14	0.021228001	0.978771999
744.5	2.7709E-14	0.021164317	0.978835683
745	2.7654E-14	0.021100824	0.978899176
745.5	2.7599E-14	0.021037522	0.978962478
746	2.7545E-14	0.020974409	0.979025591
746.5	2.7491E-14	0.020911486	0.979088514
747	2.7437E-14	0.020848752	0.979151248
747.5	2.7384E-14	0.020786205	0.979213795
748	2.7331E-14	0.020723847	0.979276153
748.5	2.7278E-14	0.020661675	0.979338325
749	2.7225E-14	0.02059969	0.97940031
749.5	2.7172E-14	0.020537891	0.979462109
750	2.712E-14	0.020476278	0.979523722
750.5	2.7068E-14	0.020414849	0.979585151
751	2.7017E-14	0.020353604	0.979646396
751.5	2.6965E-14	0.020292543	0.979707457
752	2.6914E-14	0.020231666	0.979768334
752.5	2.6863E-14	0.020170971	0.979829029
753	2.6813E-14	0.020110458	0.979889542
753.5	2.6762E-14	0.020050126	0.979949874
754	2.6712E-14	0.019989976	0.980010024
754.5	2.6662E-14	0.019930006	0.980069994
755	2.6612E-14	0.019870216	0.980129784

755.5	2.6563E-14	0.019810605	0.980189395
756	2.6514E-14	0.019751174	0.980248826
756.5	2.6465E-14	0.01969192	0.98030808
757	2.6416E-14	0.019632844	0.980367156
757.5	2.6367E-14	0.019573946	0.980426054
758	2.6319E-14	0.019515224	0.980484776
758.5	2.6271E-14	0.019456678	0.980543322
759	2.6223E-14	0.019398308	0.980601692
759.5	2.6176E-14	0.019340113	0.980659887
760	2.6129E-14	0.019282093	0.980717907
760.5	2.6081E-14	0.019224247	0.980775753
761	2.6035E-14	0.019166574	0.980833426
761.5	2.5988E-14	0.019109074	0.980890926
762	2.5941E-14	0.019051747	0.980948253
762.5	2.5895E-14	0.018994592	0.981005408
763	2.5849E-14	0.018937608	0.981062392
763.5	2.5803E-14	0.018880795	0.981119205
764	2.5758E-14	0.018824153	0.981175847
764.5	2.5713E-14	0.01876768	0.98123232
765	2.5667E-14	0.018711377	0.981288623
765.5	2.5623E-14	0.018655243	0.981344757
766	2.5578E-14	0.018599277	0.981400723
766.5	2.5533E-14	0.01854348	0.98145652
767	2.5489E-14	0.018487849	0.981512151
767.5	2.5445E-14	0.018432386	0.981567614
768	2.5401E-14	0.018377088	0.981622912
768.5	2.5358E-14	0.018321957	0.981678043
769	2.5314E-14	0.018266991	0.981733009
769.5	2.5271E-14	0.01821219	0.98178781
770	2.5228E-14	0.018157554	0.981842446
770.5	2.5185E-14	0.018103081	0.981896919
771	2.5142E-14	0.018048772	0.981951228
771.5	2.51E-14	0.017994626	0.982005374
772	2.5058E-14	0.017940642	0.982059358
772.5	2.5016E-14	0.01788682	0.98211318
773	2.4974E-14	0.017833159	0.982166841
773.5	2.4932E-14	0.01777966	0.98222034
774	2.4891E-14	0.017726321	0.982273679
774.5	2.485E-14	0.017673142	0.982326858
775	2.4808E-14	0.017620122	0.982379878
775.5	2.4768E-14	0.017567262	0.982432738
776	2.4727E-14	0.01751456	0.98248544
776.5	2.4686E-14	0.017462017	0.982537983

777	2.4646E-14	0.017409631	0.982590369
777.5	2.4606E-14	0.017357402	0.982642598
778	2.4566E-14	0.017305329	0.982694671
778.5	2.4526E-14	0.017253414	0.982746586
779	2.4487E-14	0.017201653	0.982798347
779.5	2.4447E-14	0.017150048	0.982849952
780	2.4408E-14	0.017098598	0.982901402
780.5	2.4369E-14	0.017047302	0.982952698
781	2.433E-14	0.01699616	0.98300384
781.5	2.4292E-14	0.016945172	0.983054828
782	2.4253E-14	0.016894336	0.983105664
782.5	2.4215E-14	0.016843653	0.983156347
783	2.4177E-14	0.016793122	0.983206878
783.5	2.4139E-14	0.016742743	0.983257257
784	2.4101E-14	0.016692515	0.983307485
784.5	2.4063E-14	0.016642437	0.983357563
785	2.4026E-14	0.01659251	0.98340749
785.5	2.3989E-14	0.016542733	0.983457267
786	2.3952E-14	0.016493104	0.983506896
786.5	2.3915E-14	0.016443625	0.983556375
787	2.3878E-14	0.016394294	0.983605706
787.5	2.3841E-14	0.016345111	0.983654889
788	2.3805E-14	0.016296076	0.983703924
788.5	2.3768E-14	0.016247188	0.983752812
789	2.3732E-14	0.016198446	0.983801554
789.5	2.3696E-14	0.016149851	0.983850149
790	2.3661E-14	0.016101401	0.983898599
790.5	2.3625E-14	0.016053097	0.983946903
791	2.359E-14	0.016004938	0.983995062
791.5	2.3554E-14	0.015956923	0.984043077
792	2.3519E-14	0.015909052	0.984090948
792.5	2.3484E-14	0.015861325	0.984138675
793	2.3449E-14	0.015813741	0.984186259
793.5	2.3415E-14	0.0157663	0.9842337
794	2.338E-14	0.015719001	0.984280999
794.5	2.3346E-14	0.015671844	0.984328156
795	2.3312E-14	0.015624828	0.984375172
795.5	2.3278E-14	0.015577954	0.984422046
796	2.3244E-14	0.01553122	0.98446878
796.5	2.321E-14	0.015484626	0.984515374
797	2.3176E-14	0.015438172	0.984561828
797.5	2.3143E-14	0.015391858	0.984608142
798	2.3109E-14	0.015345682	0.984654318

798.5	2.3076E-14	0.015299645	0.984700355
799	2.3043E-14	0.015253746	0.984746254
799.5	2.301E-14	0.015207985	0.984792015
800	2.2978E-14	0.015162361	0.984837639

$dt = 10. t$ increment is 10

Time/Day	Susceptible	Infected	Removed
0	0.999999982	1.82927E-08	0
10	0.999999948	5.14024E-08	1.09756E-09
20	0.999999851	1.44441E-07	4.18171E-09
30	0.999999581	4.05879E-07	1.28482E-08
40	0.999998822	1.14052E-06	3.72009E-08
50	0.99999669	3.20486E-06	1.05632E-07
60	0.999990696	9.00562E-06	2.97923E-07
70	0.999973856	2.53056E-05	8.38261E-07
80	0.999926536	7.11076E-05	2.3566E-06
90	0.999793574	0.000199803	6.62306E-06
100	0.99942002	0.000561368	1.86112E-05
110	0.99837087	0.001576836	5.22933E-05
120	0.99542699	0.004426107	0.000146904
130	0.987188021	0.01239951	0.00041247
140	0.96429801	0.034545549	0.00115644
150	0.902004187	0.094766639	0.003229173
160	0.742156764	0.248928064	0.008915172
170	0.396686146	0.579462999	0.023850856
180	-0.033161299	0.974542663	0.058618636
190	0.027271679	0.855637126	0.117091195
200	-0.016364137	0.847934714	0.168429423
210	0.009583459	0.771111035	0.219305506
220	-0.004235675	0.738663507	0.265572168
230	0.001615066	0.688492956	0.309891978
240	-0.000464302	0.649262747	0.351201556
250	9.9417E-05	0.609743263	0.39015732
260	-1.39402E-05	0.573272024	0.426741916
270	1.00396E-06	0.538860758	0.461138238
280	-7.69997E-09	0.506530125	0.493469883
290	-4.06471E-10	0.47613831	0.523861691
300	-4.45579E-11	0.447570011	0.552429989
310	-7.26491E-12	0.42071581	0.57928419
320	-1.54932E-12	0.395472862	0.604527138
330	-4.03546E-13	0.37174449	0.62825551
340	-1.23016E-13	0.34943982	0.65056018

350	-4.26309E-14	0.328473431	0.671526569
360	-1.64451E-14	0.308765025	0.691234975
370	-6.94984E-15	0.290239124	0.709760876
380	-3.17784E-15	0.272824776	0.727175224
390	-1.55656E-15	0.25645529	0.74354471
400	-8.10078E-16	0.241067972	0.758932028
410	-4.44897E-16	0.226603894	0.773396106
420	-2.56372E-16	0.21300766	0.78699234
430	-1.54253E-16	0.200227201	0.799772799
440	-9.64969E-17	0.188213569	0.811786431
450	-6.25339E-17	0.176920755	0.823079245
460	-4.18451E-17	0.166305509	0.833694491
470	-2.88316E-17	0.156327179	0.843672821
480	-2.04032E-17	0.146947548	0.853052452
490	-1.47966E-17	0.138130695	0.861869305
500	-1.09746E-17	0.129842853	0.870157147
510	-8.30987E-18	0.122052282	0.877947718
520	-6.41324E-18	0.114729145	0.885270855
530	-5.03732E-18	0.107845397	0.892154603
540	-4.02144E-18	0.101374673	0.898625327
550	-3.25909E-18	0.095292192	0.904707808
560	-2.67834E-18	0.089574661	0.910425339
570	-2.2297E-18	0.084200181	0.915799819
580	-1.87863E-18	0.07914817	0.92085183
590	-1.60058E-18	0.07439928	0.92560072
600	-1.37789E-18	0.069935323	0.930064677
610	-1.19769E-18	0.065739204	0.934260796
620	-1.05046E-18	0.061794852	0.938205148
630	-9.29071E-19	0.058087161	0.941912839
640	-8.28153E-19	0.054601931	0.945398069
650	-7.43594E-19	0.051325815	0.948674185
660	-6.72224E-19	0.048246266	0.951753734
670	-6.11576E-19	0.04535149	0.95464851
680	-5.5971E-19	0.042630401	0.957369599
690	-5.1509E-19	0.040072577	0.959927423
700	-4.76491E-19	0.037668222	0.962331778
710	-4.42928E-19	0.035408129	0.964591871
720	-4.136E-19	0.033283641	0.966716359
730	-3.87857E-19	0.031286623	0.968713377
740	-3.65165E-19	0.029409425	0.970590575
750	-3.45083E-19	0.02764486	0.97235514
760	-3.27244E-19	0.025986168	0.974013832
770	-3.11341E-19	0.024426998	0.975573002

780	-2.9712E-19	0.022961378	0.977038622
790	-2.84362E-19	0.021583696	0.978416304
800	-2.72885E-19	0.020288674	0.979711326