HW1

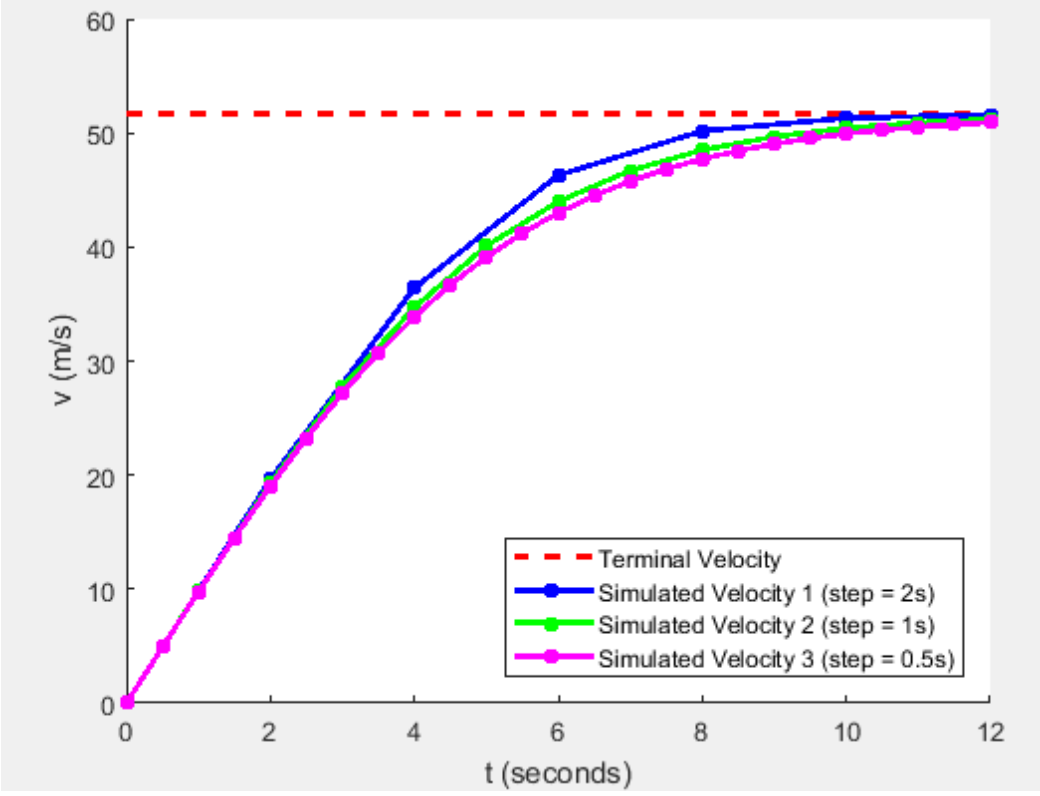
1.) The output of size(A*B) is [3 4] because matrix A had the largest y value of 3 and matrix B had the largest x value of 4. The output of size(B*A) is error "Matrix dimensions must agree."

2.) The output of a*b is error "Inner matrix dimensions must agree." The output of a.*b is [2 6 12 20] because the dot after value a is a dot operator, which multiplies the first element from a with the first from b, the second element from a with the second from b, etc.

3.)

t (s)	v (m/s)
0	0
2.0000	19.6200
4.0000	36.4137
6.0000	46.2983
8.0000	50.1802
10.0000	51.3123
12.0000	51.6008

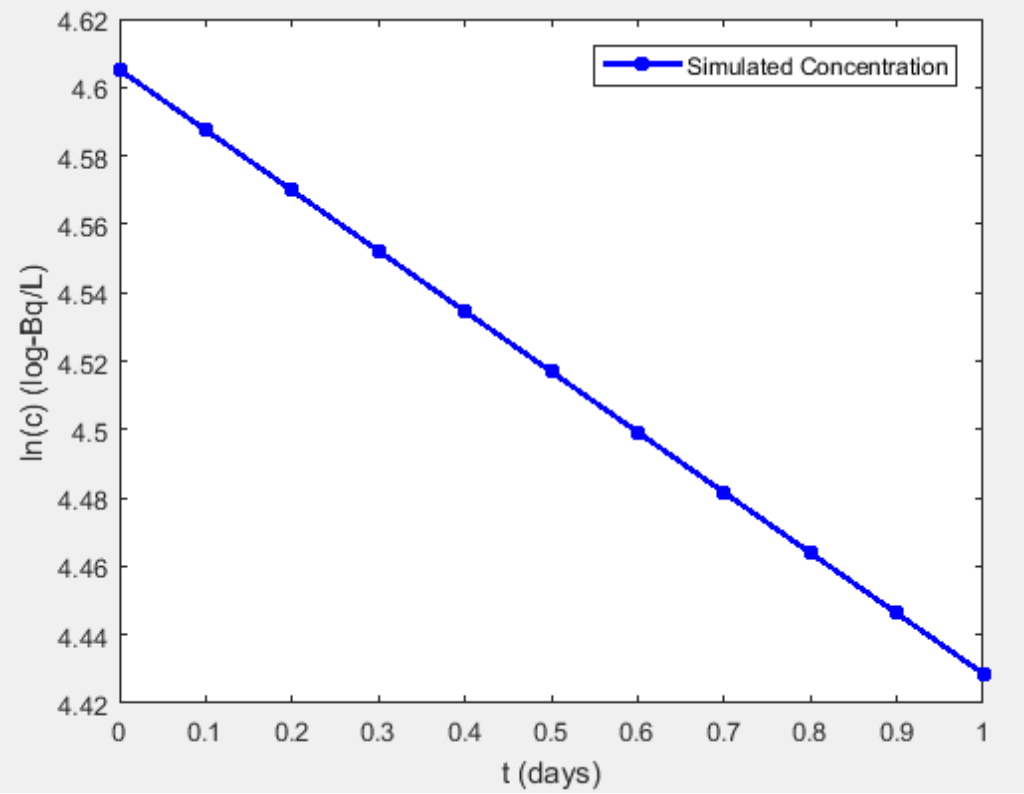
4.)



As the step size decreases, more instances are plotted, making the simulated velocity more accurately represent actual velocity.

5.)

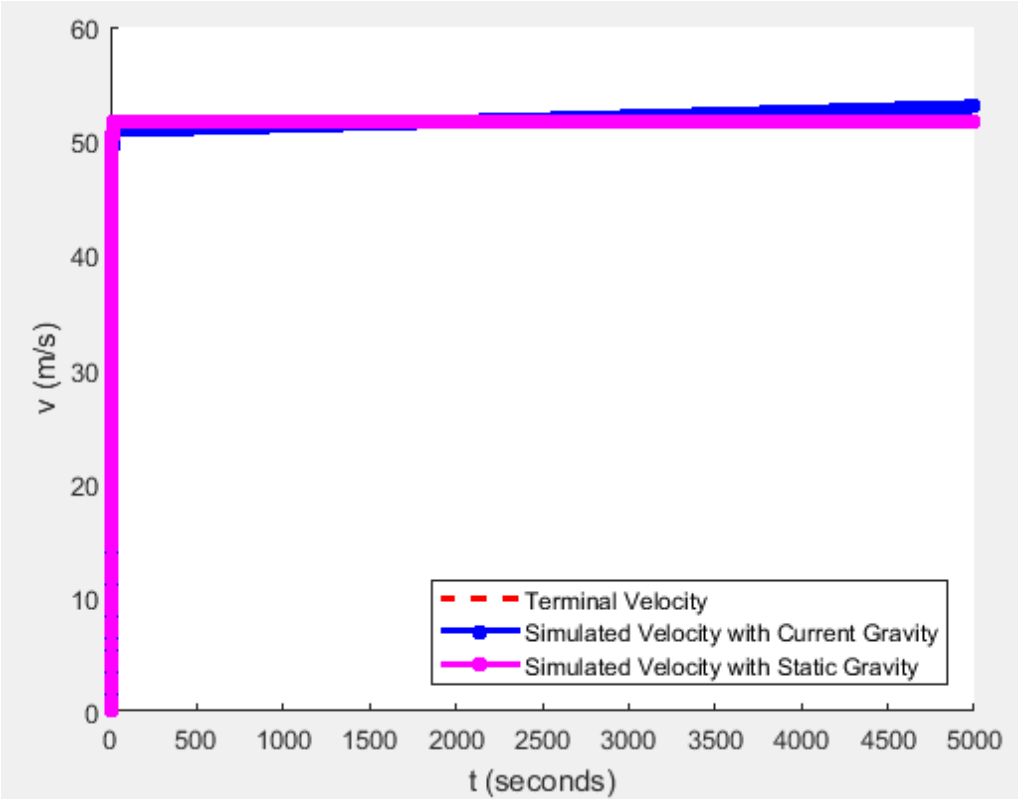
t (days)	ln(c) (log-Bq/L)
0	100.0000
0.1000	98.2500
0.2000	96.5306
0.3000	94.8413
0.4000	93.1816
0.5000	91.5509
0.6000	89.9488
0.7000	88.3747
0.8000	86.8281
0.9000	85.3086
1.0000	83.8157



The slope between each point is -5.6641, meaning that the plot is linear; the natural logarithm of concentration and time are linear.

6.) The water required to maintain a steady state is the difference between the matter leaving the system and the matter entering the system (water = m_out - m_in). The matter leaving the system is the sum of exhaled air, sweat, urine, feces, and skin. The matter entering the system is the sum of food, metabolized matter, and inhaled air. The water required for this system to maintain a steady state is 1.3 L.

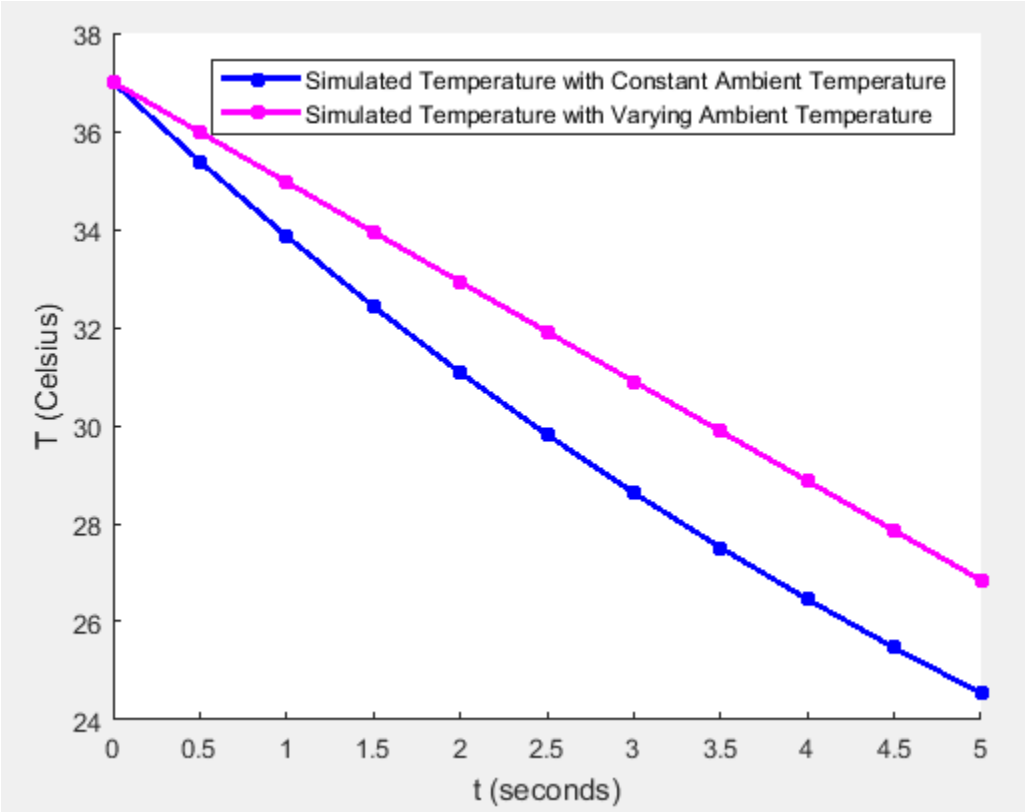
7.)



The simulated gravity with current gravity plot does not take into account actually reaching the earth's surface. Past the point where the two plots intersect is all theoretical because the earth's surface would stop an object from continuing to accelerate.

8.)

Constant Ta		Varying Ta	
t (hour)	T (Celsius)	t (hour)	T (Celsius)
0	37.0000	0	37.0000
0.5000	35.3800	0.5000	35.9800
1.0000	33.8572	1.0000	34.9612
1.5000	32.4258	1.5000	33.9435
2.0000	31.0802	2.0000	32.9269
2.5000	29.8154	2.5000	31.9113
3.0000	28.6265	3.0000	30.8966
3.5000	27.5089	3.5000	29.8828
4.0000	26.4584	4.0000	28.8699
4.5000	25.4709	4.5000	27.8577
5.0000	24.5426	5.0000	26.8462


Simulated Temperature with Constant Ambient Temperature
Simulated Temperature with Varying Ambient Temperature
T (Celsius)
t (seconds)
38
36
34
32
30
28
26
24
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5