Name_____ **CM#**_____

Day 35-Concept Question

If we have a tank with a hole in it, the height of the fluid in the tank can often be modeled with the equation

$$\frac{d\,h}{d\,t} = -k\sqrt{h} \qquad (1)$$

We would need to have an initial value for the height of the fluid in the tank, say $h(0) = 10$. If we apply Euler's method to equation (1), we can write the resulting equation in the form

$$h_{n+1} = h_n - \Delta t\; k\sqrt{h_n}$$

Your friend has coded this up in Matlab, and produced the following really poorly commented piece of code. Since you are friends, you agree to look at the code anyway, and you don't whine too much about the lack of comments.

```
clear variables
close all
clc
k=1;
h(1,1)=10;
t(1,1)=0;
dt=0.1;
n=1;
while h(n,1)> 0
    t(n+1,1)=t(n,1)+dt;
    h(n+1,1)=h(n,1)-t(n,1)*k*sqrt(h(n,1));
    n=n+1;
end
plot(t,h)
```

The code runs, and produces a plot that looks halfway decent. However, the tank should take 6 seconds to drain and it is only taking one second. Mark the correction on the code.