ECE 495 Homework

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Due September 8, 2014

Example 5 (p 17)

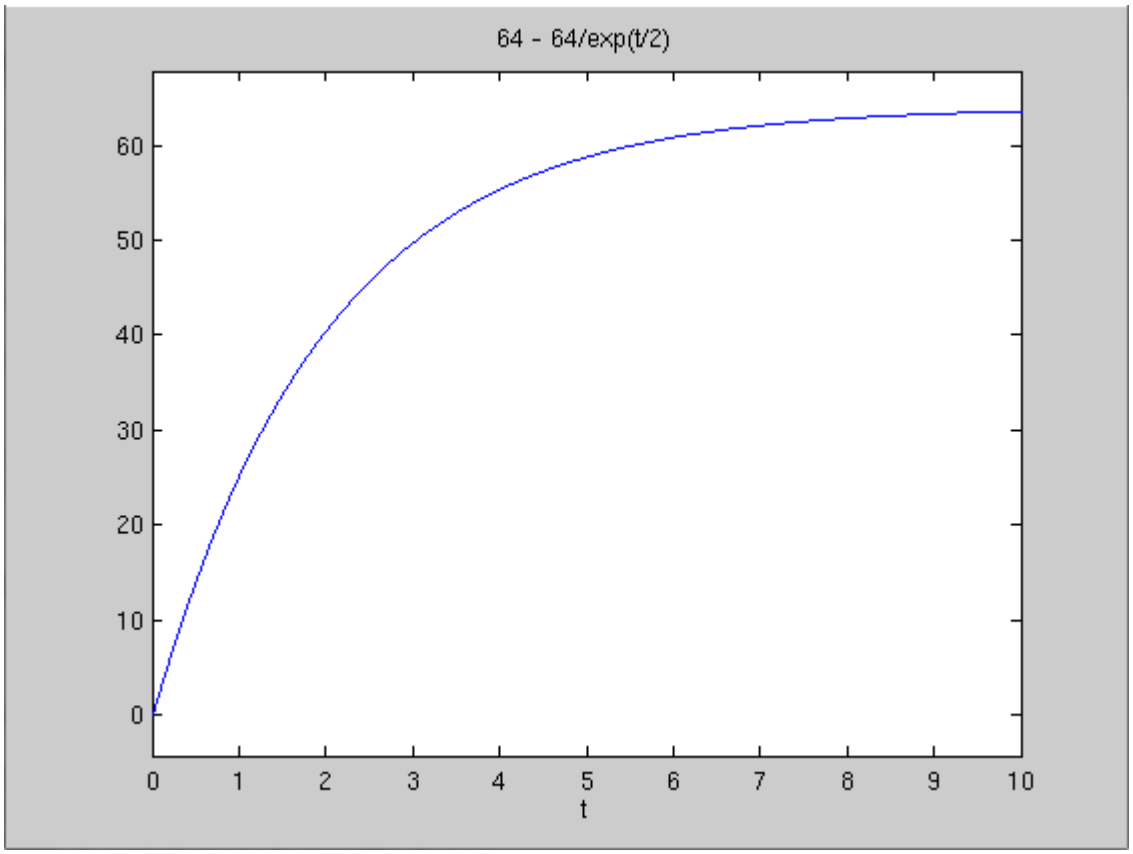
Predict the motion of an object of mass m falling near the earth's surface under the force of gravity and air resistance that is proportional to velocity.

Given: m(dv/dt)=mg-cv

Given: g=32, m=2, c=1

```
>> dsolve('m*Dv=32*2-v','v(0)=0','t')
ans =
64 - 64/exp(t/m)
```

Now ezplot the equation:



Example 4 (p 25)

A 40 liter tank is initially half-full of water. A solution containing 10 grams per liter of salt begins to

flow in at 4 liters per minute and the mixed solution flows out at 2 liters per minute. How much salt is in the tank just before it overflows?

```
>> dsolve('Dx=4*10-2*x/(2*t+20)','x(0)=0','t')
ans =
20*t - 2000/(t + 10) + 200
```

We know the overflow occurs when V (liters) = 40:

```
>> solve('40=2*t+20','t')
ans =
10
```

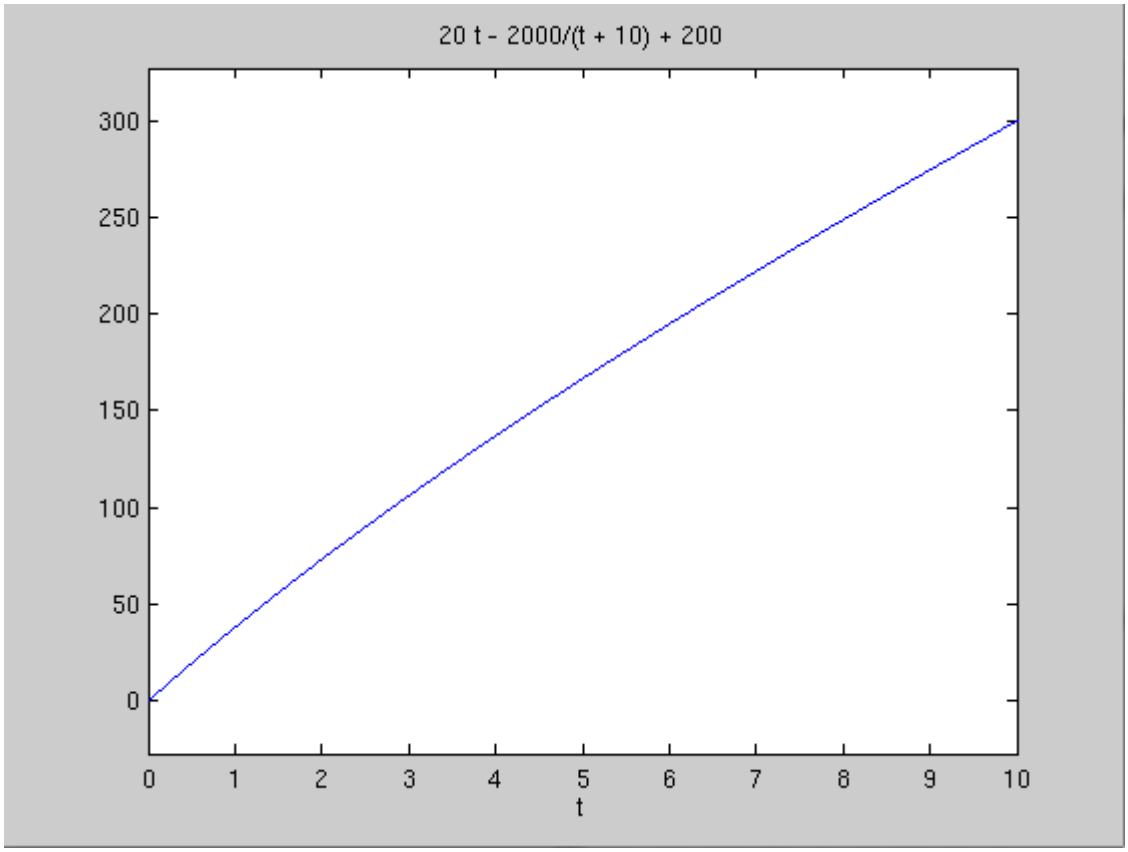
Now we assign a value to t:

```
>> t=10
t =
    10
```

We run our solve again with this value:

```
>> syms t;
>> subs(dsolve('Dx=4*10-2*x/(2*t+20)','x(0)=0','t'),t,10)
ans =
300
```

Now we ezplot (with the *equation*, not the final answer!):


20 t - 2000/(t + 10) + 200
300
250
200
150
100
50
0
0
1
2
3
4
5
6
7
8
9
10
t

How to Submit your Bitbucket Application

* Visit the online app: http://tp3.fdisk.co
* Log in using your UNM Net ID and

password
* Add your name and class section
* Click New Submission and type in your BitBucket or GitHub URL
* If you make a mistake, you may retract your

submission and try again

NOTES:

For the time being, these are being manually graded. You will not receive a grade until your application is graded.

This will be changed in the near future, and grading will be integrated in the app.

If you have any questions about the app, contact one of our course TAs:

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