hw6

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Numerical Analysis HW6
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In [1]:
```
%%file F.m
function z=F(s, doplt)
%  (a,b) is the time interval
%   yb is the desired BC at the far end t=b
a=1;b=2;yb=1/12;
%
ydot=@(t,y) [y(2);18*(y(1))^2];
% [t,y]=ode45(ydot,[a,b],[ya,s]);
[t,y]=ode45(ydot,[a,b],[1/3,s]);
if exist('doplt', 'var')
plot(t, y(:,1))
end
z=y(end,1)-yb; % end means last entry of solution y
end
%
```

```
Created file '/home/xren/Dropbox/numan/hw06/F.m'.
```

In [2]:
```
%%file G.m
function z=G(s, doplt)
%  (a,b) is the time interval
%   yb is the desired BC at the far end t=b
a=0;b=1;yb=log(2);
%
ydot=@(t,y) [y(2);2*exp(2*y(1)^2)*(1-t*t)];
% [t,y]=ode45(ydot,[a,b],[ya,s]);
[t,y]=ode45(ydot,[a,b],[0,s]);
if exist('doplt', 'var')
plot(t, y(:,1))
end
z=y(end,1)-yb; % end means last entry of solution y
end
%
```

```
Created file '/home/xren/Dropbox/numan/hw06/G.m'.
```

```
In [3]: G(0)
```

```
ans =

    0.2095
```

```
In [4]: F(1)
```

```
Warning: Failure at t=1.937888e+00.  Unable to meet integration tolerances without reducing the
> In ode45 (line 360)
  In F (line 8)

ans =

   5.4715e+27
```

```
In [5]: F(-1)
```

```
ans =

   -0.4334
```

```
In [6]: F(-0)
```

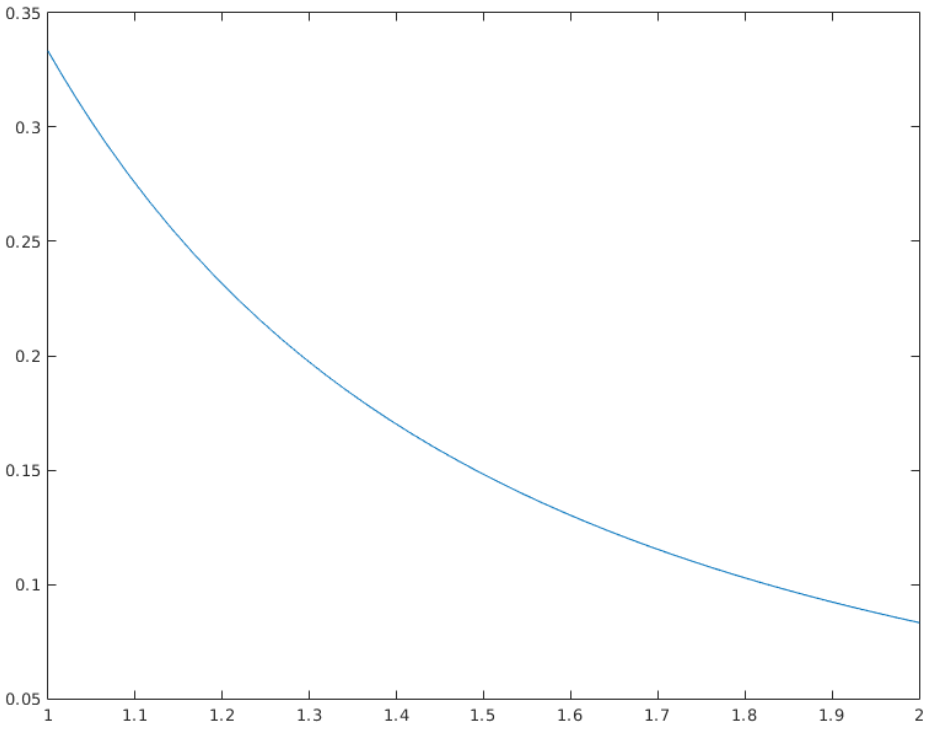
```
ans =

    7.1725
```

```
In [7]: G(0)
```

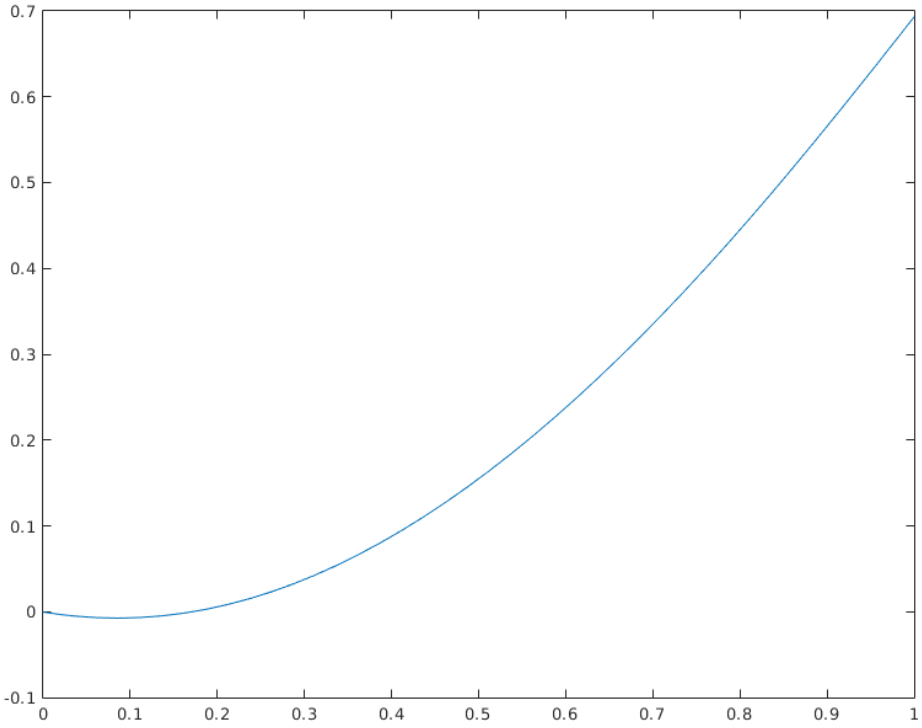
```
ans =

    0.2095
```

```
In [8]: G(0.5)


ans =

    1.5342



In [9]: G(-0.5)


ans =

   -0.3545



In [10]: G(1)

Warning: Failure at t=7.616324e-01.  Unable to meet integration tolerances without reducing the
> In ode45 (line 360)
  In G (line 8)

ans =

    5.0198



In [11]: sF=fzero(@F,[-1,0.0])


sF =

   -0.6667



In [12]: sG=fzero(@G,[-0.5,0])


sG =

   -0.1701



In [13]: F(sF, true)
```

```
ans =

  -2.9143e-16
```




```
In [14]: G(sG, true)

ans =

  -2.2204e-16
```


0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
-0.1
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1