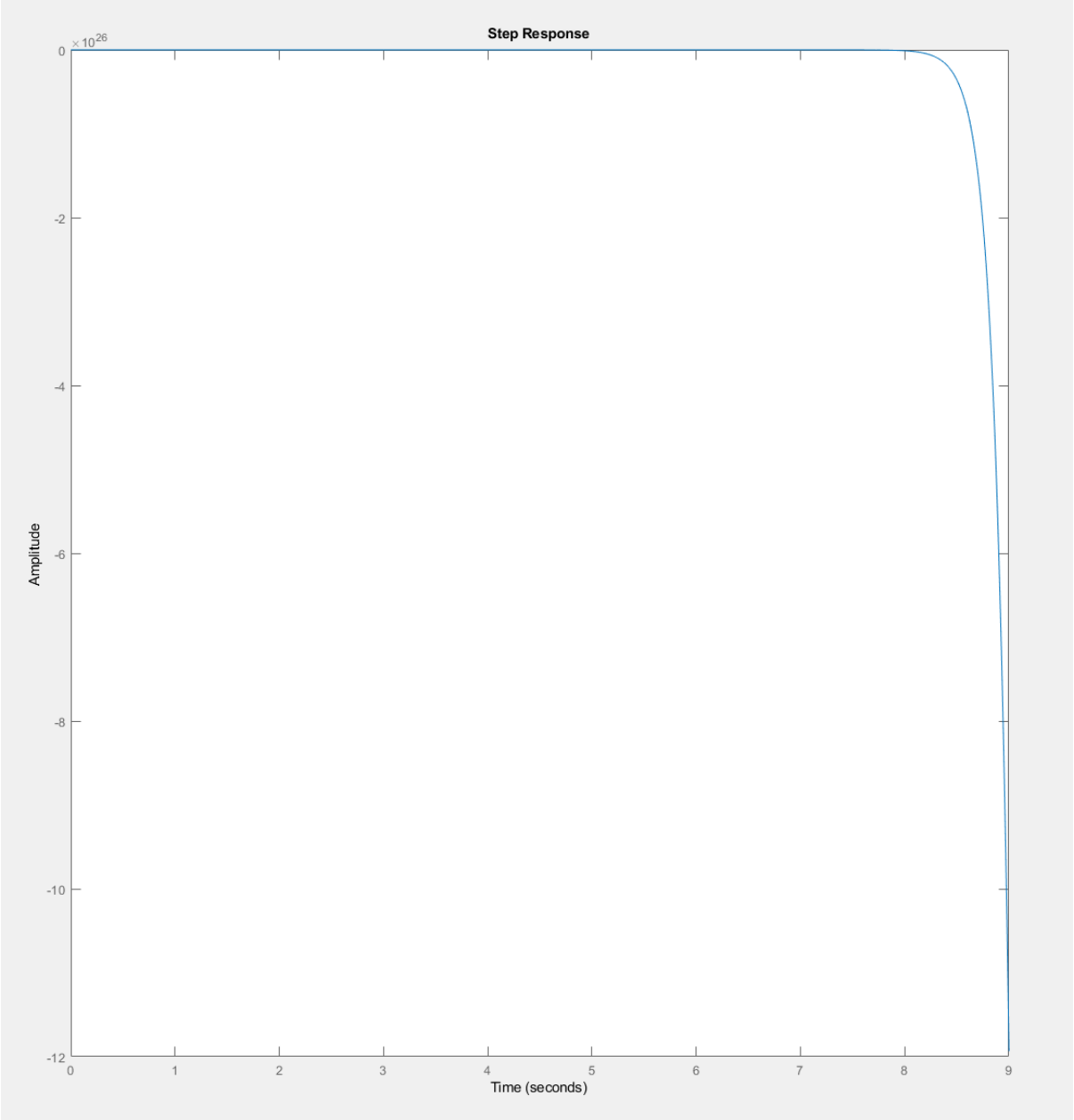
S2 lab prep

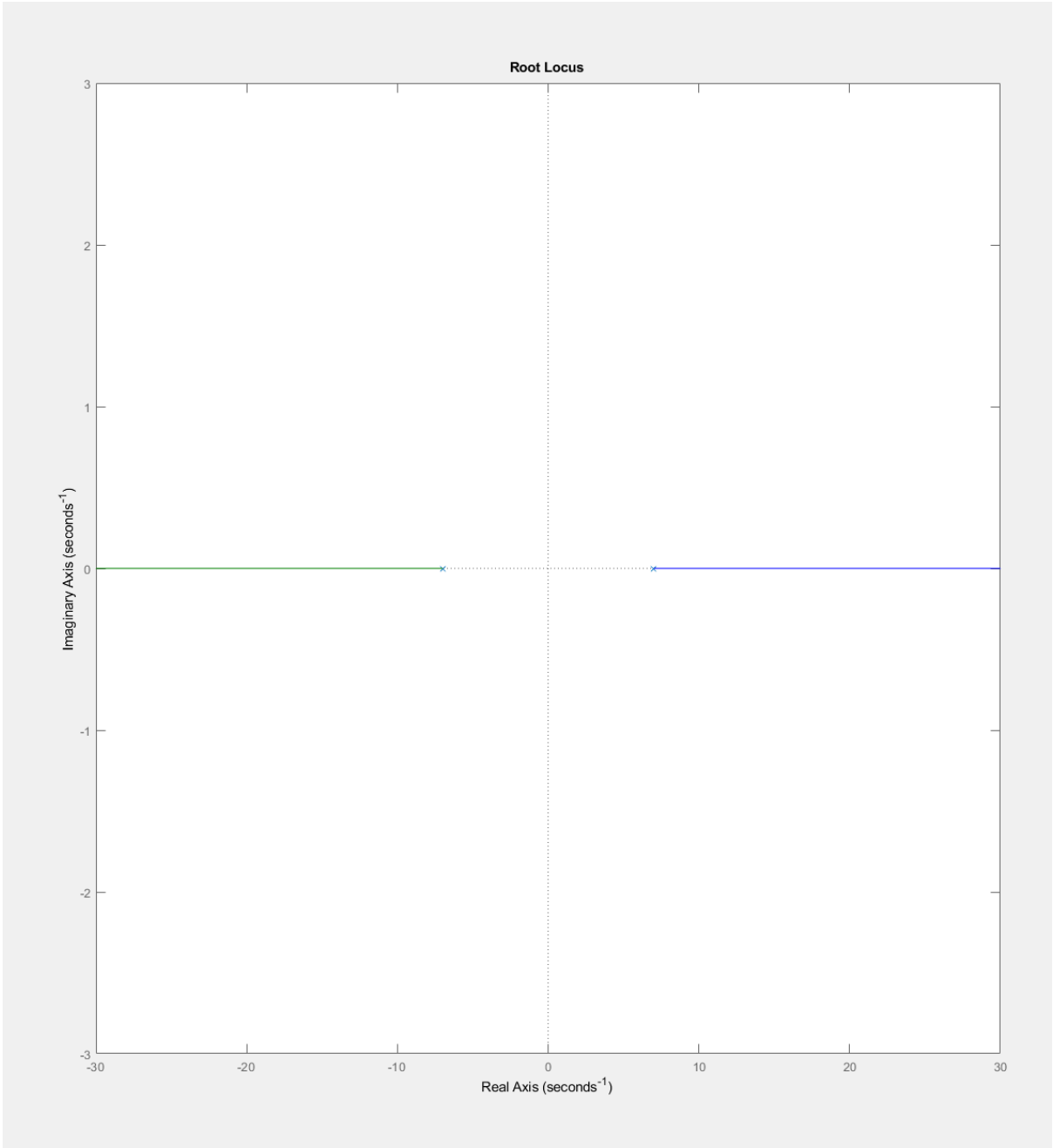
1.) P(s) = -(g/l)/(s^2-(g/l)) = -49.05/(s^2-49.05)
2.) This is the matlab code used to generate the unit response.

```
s = tf('s');
pendulum = -(9.81/0.2)/(s^2-(9.81/0.2));
step(pendulum)
```

3.) This is the graph generated by the step respose



4.) This plant is not stable it goes from an exceedingly large number to negative without resting. This can also been shown via a root locus plot.


Root Locus
Imaginary Axis (seconds-1)
Real Axis (seconds-1)
3
2
1
0
-1
-2
-3
-30
-20
-10
0
10
20
30