Project 2

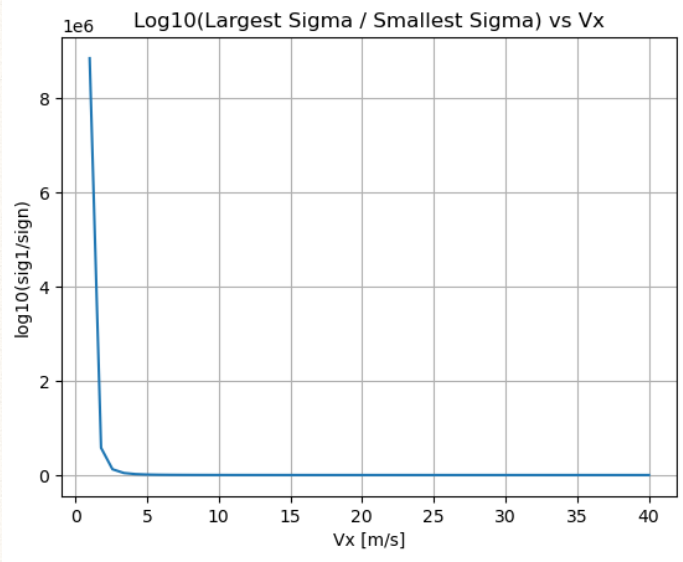
Jae seok oh (jaeseoko)

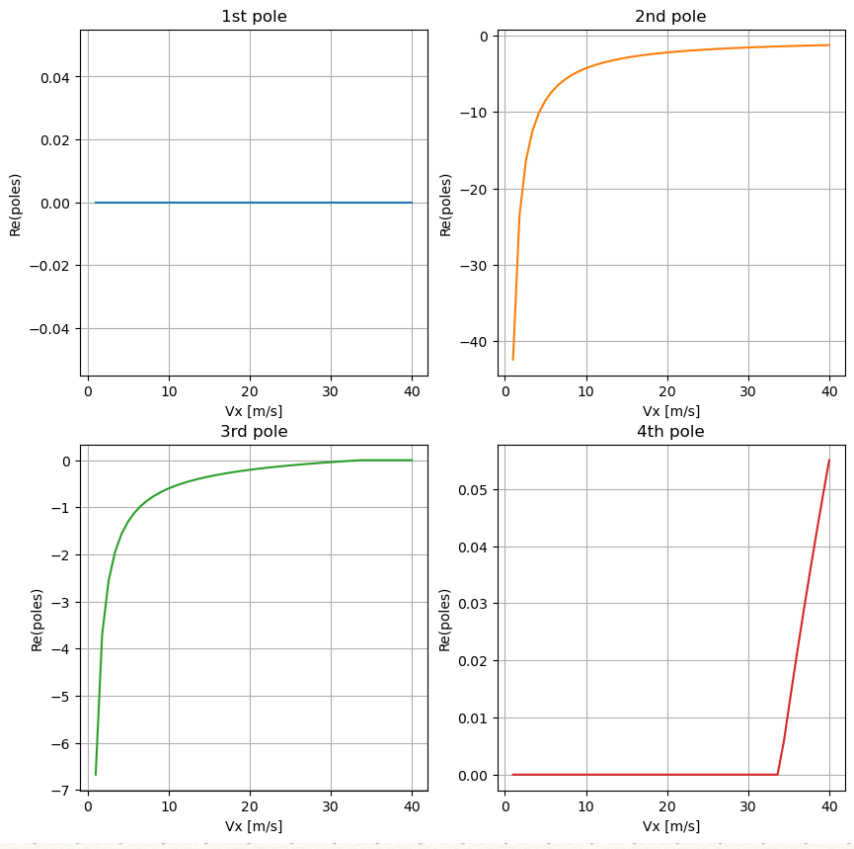
exercise 1.1)

```
Rank of P =  4
(4, 8)
Rank of Q =  4
(16, 4)
Rank of P =  4
(4, 8)
Rank of Q =  4
(16, 4)
Rank of P =  4
(4, 8)
Rank of Q =  4
(16, 4)
Both controllable and observable for given x velocities
```

Calculated in Q1.PY

exercise 1.2)





Looking at the change in poles, we can observe that poles trend to zero as velocity increases, which indicate they become more responsive, but less stable at the same time, & 4th plot shows that system goes unstable past certain velocity.

In $\log_{10}(\sigma_1/\sigma_n)$ plot, as the velocity increases, the value converges to zero, which indicate the singular values are converging to same value & this indicates more controllability. (easier)

Exercise 2 plot