Problem Wk.6.1.3: Proportional plus Angle

Part 1: anglePlusPropModel

We wish to analyze the behavior of the angle-plus-proportional controller described by

```
omega[n] = k3 * e[n] - k4 * theta[n].
```

Use the functions and methods associated with the `sf` module to construct a procedure called that takes two required arguments:

- the proportional gain `k3` applied to the error at time `n`, and
- the angle gain `k4` applied to the angle at time `n`

and which returns a system function for a system whose input is the desired distance and whose output is the actual distance.

You can debug these in Idle by using the file `designLab06Work.py`.

Part 2: Gains

Consider four different values of k3: 1, 3, 10, and 30. For each value of k3, use `optimize.optOverLine` (from the `optimize` module) to determine the value of k4 that minimizes the magnitude of the least stable pole.

Enter 2 decimal place of accuracy for k3 and 2 decimal places for the pole magnitude.

1.

k3	k4	magnitude of dominant pole
1		
3		
10		
30		