

$$4) G(s) = \frac{100}{(s+0.5)(s+2)(s+6)}$$

• No err step

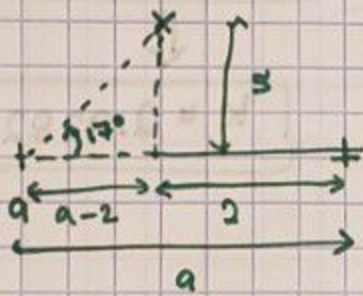
• CL DP @ $-2+j5$

$$\text{Let } C(s) = K \frac{(s+0.5)(s+2)}{(s)(s+a)}$$



Now CG $|_{s=-2+j5}$ without $(s+a) \Rightarrow -163^\circ$

Need $\angle s+a = 17^\circ$



$$\tan 17^\circ = \frac{5}{a-2}$$

$$a-2 = \frac{5}{\tan} \rightarrow a = \frac{5}{\tan} + 2 \approx 18.5$$

$$CG = K \frac{100}{s(s+6)(s+18.5)}$$

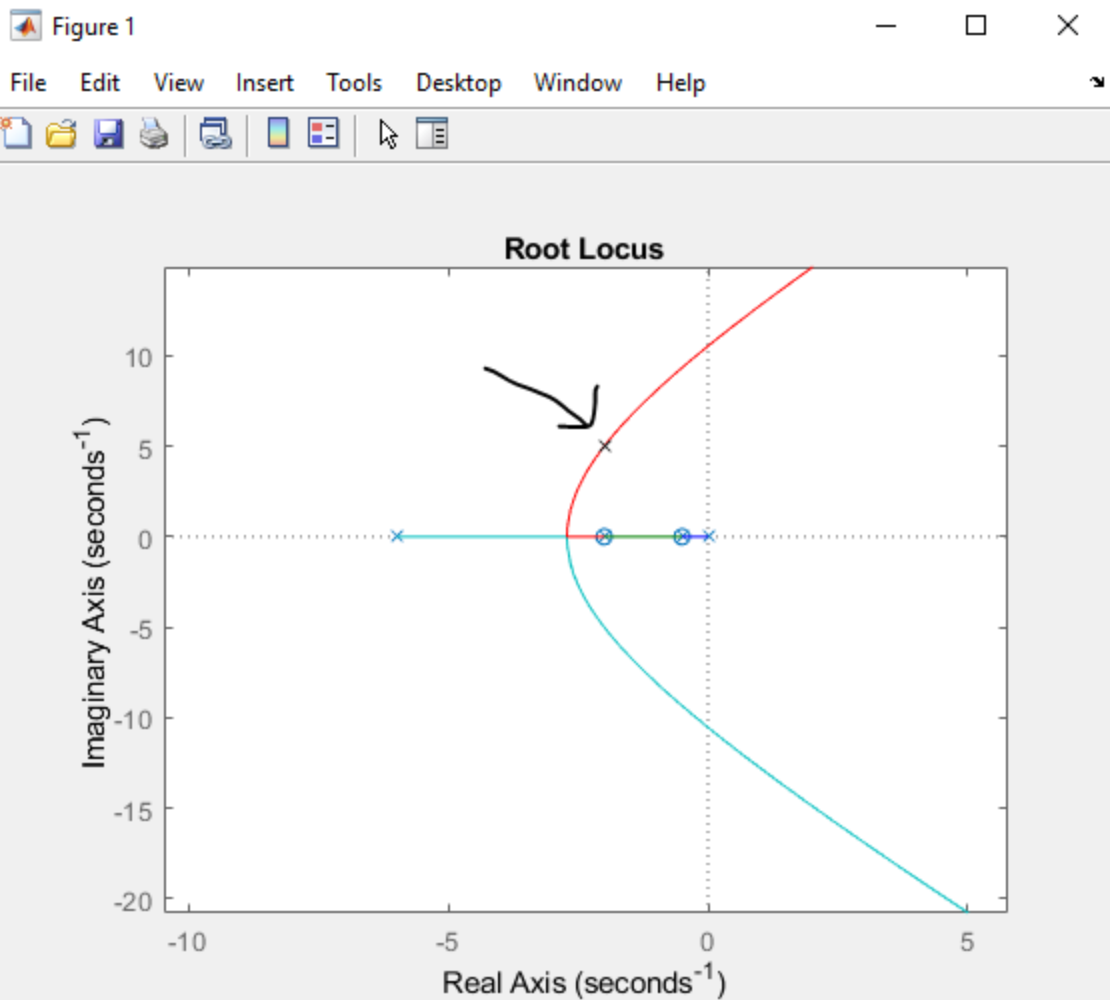


$$K = \frac{-s(s+6)(s+18.5)}{100}$$

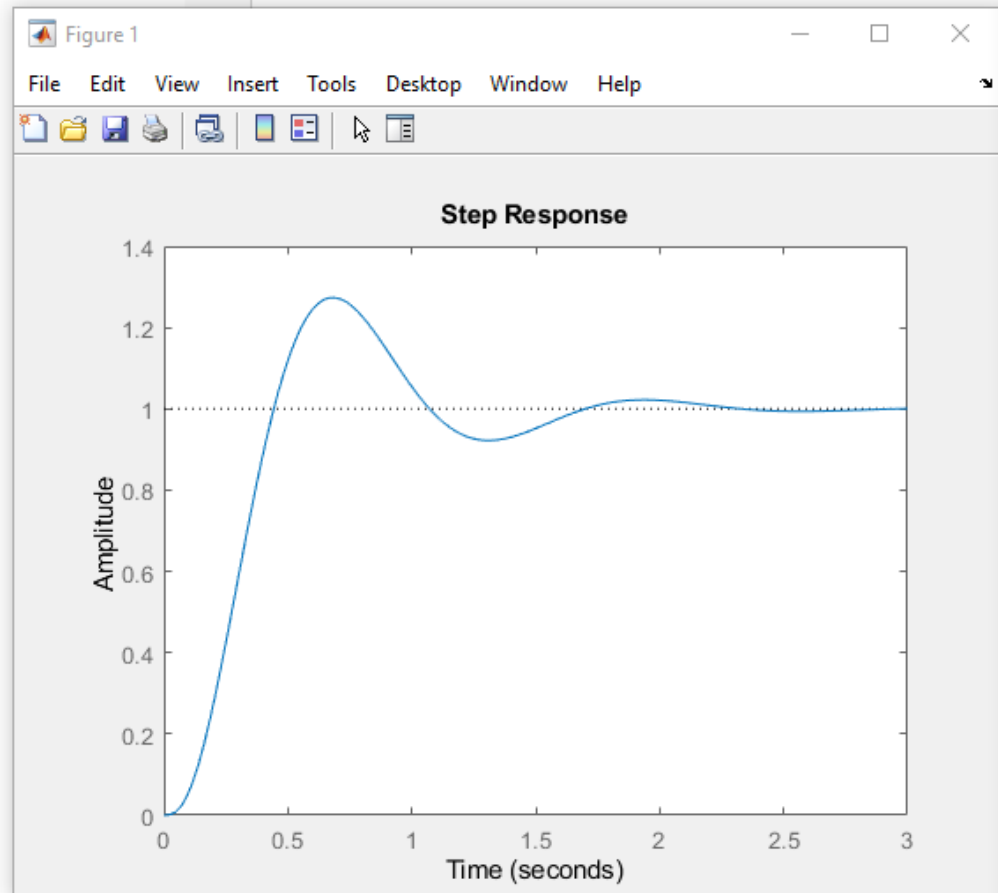
$$\Rightarrow K(-2+j5) = 5.9450$$

So,

$$C(s) = 5.9450 \frac{(s+0.5)(s+2)}{s(s+18.5)}$$



QUESTION 5



Current Folder

Name

- html
- HW7
- HW8
- HW9
- HW10
- HW11
- Bode2.m
- dig_vs_an_freq...
- Digital Control ...
- ECE461 HW5 P...
- ECE461 HW6 P...
- ECE461 HW6 P...
- transient_specs.m (Scri...

Editor - C:\Users\almos\OneDrive\Documents\Control Systems\nichols_on_tf.m

Bode2.m x Nichols2.m x transient_specs.m x nichols_on_data.m x

```
1 - G = zpk([], [-0.1617, -1.04, -2.719, -5.05], 1.0);
2 - w = logspace(-1, 1, 1001);
3 - Gw = Bode2(G, w);
4 - Nichols2(Gw, 1.5);
```

Command Window

New to MATLAB? See resources for [Getting Started](#).

ans =

struct with fields:

- RiseTime: 0.2779
- SettlingTime: 2.0259
- SettlingMin: 0.9220
- SettlingMax: 1.2736
- Overshoot: 27.3581
- Undershoot: 0
- Peak: 1.2736
- PeakTime: 0.6908

fx >>

5) Given the following stable system