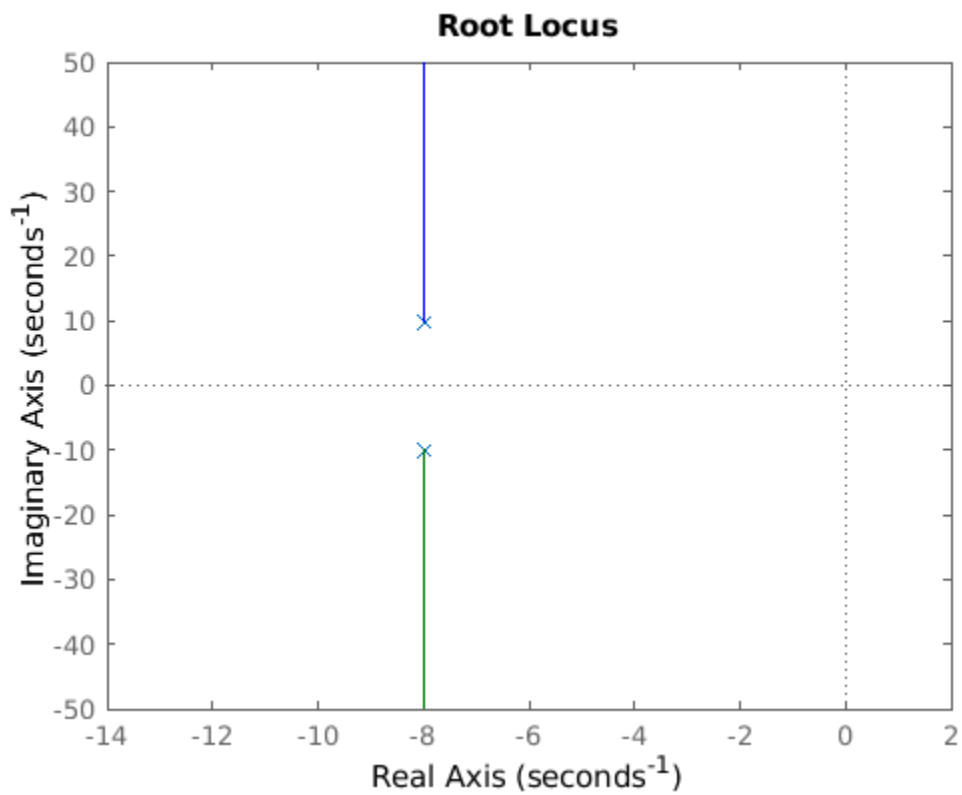

```
G = tf(160, [1, 16, 160])
```

```
rlocus(G)
```

```
G =
```

$$\frac{160}{s^2 + 16s + 160}$$

Continuous-time transfer function.



```
K1 = 0.374
```

```
Phi = -4.85 + 12.57i
```

```
theta_c = pi - angle(evalfr(G, Phi))
```

```
p1d = -80
```

```
z1d = real(Phi) - abs(imag(Phi)) / tan(theta_c + angle(Phi - p1d))
```

```
C1d = zpk(z1d, p1d, 1)
```

rlocus(-Cld * G)

K1 =

0.3740

Phi =

-4.8500 +12.5700i

theta_c =

5.2941

pld =

-80

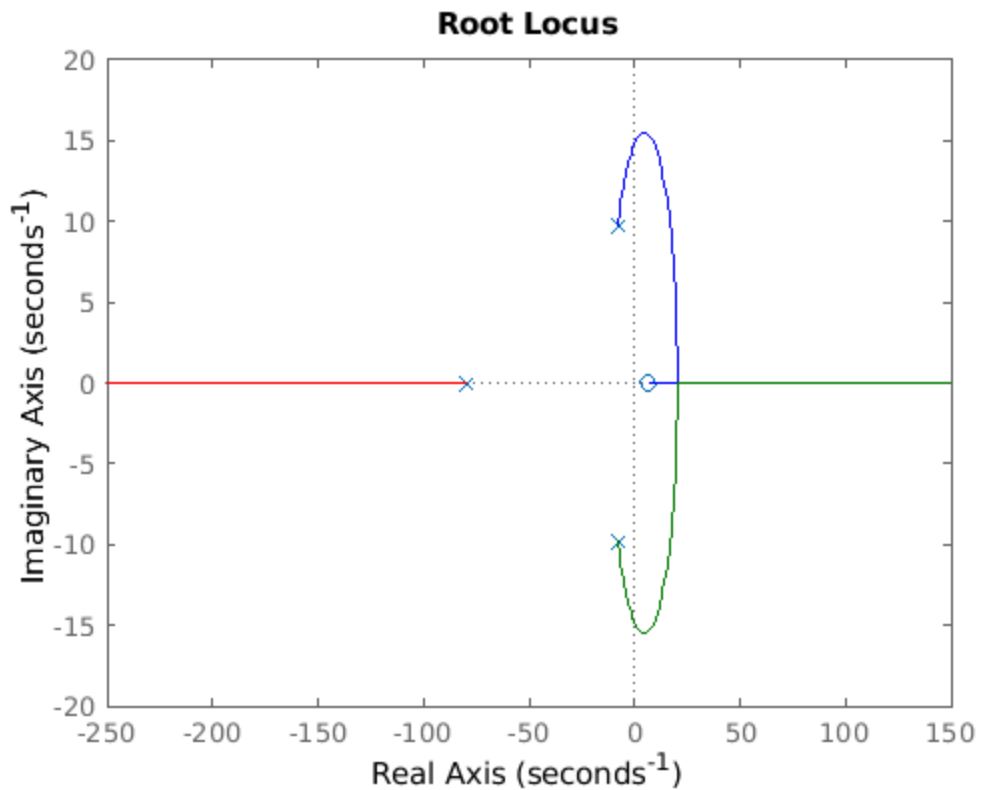
zld =

6.8013

Cld =

$$\frac{(s-6.801)}{(s+80)}$$

Continuous-time zero/pole/gain model.



K2 = -2.73

```
sys_ol = K2 * Cld * G
```

```
Kp = evalfr(sys_ol, 0)
ss_error = 1 / (1 + Kp)
```

```
step(feedback(sys_ol, 1))
```

```
stepinfo(feedback(sys_ol, 1))
```

K2 =

-2.7300

sys_ol =

$$\frac{-436.8 (s-6.801)}{(s+80) (s^2 + 16s + 160)}$$

Continuous-time zero/pole/gain model.

$K_p =$

0.2321

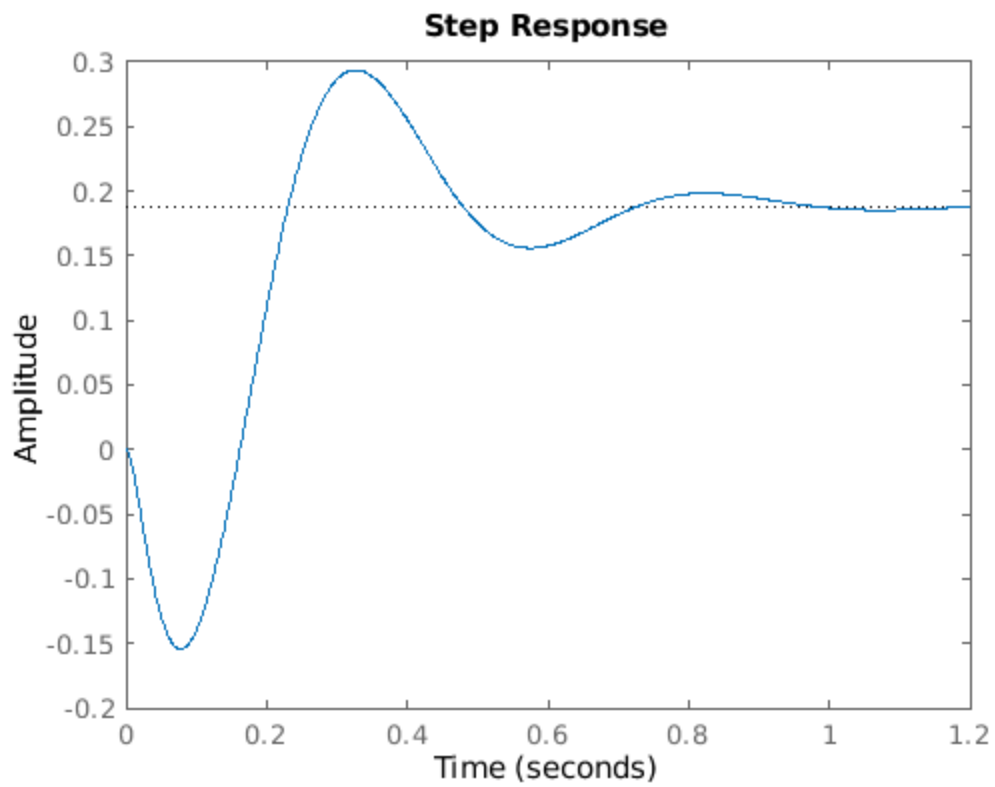
$ss_error =$

0.8116

$ans =$

struct with fields:

RiseTime: 0.0544
TransientTime: 0.8903
SettlingTime: 0.9272
SettlingMin: 0.1560
SettlingMax: 0.2938
Overshoot: 55.9464
Undershoot: 81.9625
Peak: 0.2938
PeakTime: 0.3268



$\alpha = ss_error / 0.05$

alpha =

16.2325

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