Exercise 5.3

Consider a system

$$G(s) = \frac{1}{s^2 + s}$$

and controller

$$K(s) = k\frac{s+2}{s+10}.$$

Draw a root locus plot for the system in MATLAB (use `rlocus`), and determine k such that the rise time is less than 0.25 s and the overshoot is smaller than 20 %.

```
s = tf('s');
G = 1 / (s^2 + s);
%syms k;
K =  (s + 2) / (s + 10);

rlocus(G*K)

w_n = 1.8 / 0.25

sigma = sqrt(((log(0.2)/-pi)^2)/(1+((log(0.2)/-pi)^2)))
```

```
w_n = 7.2000

sigma = 0.4559
```

```
vinkel = 0.4734

grader = 27.1261
```


Root Locus