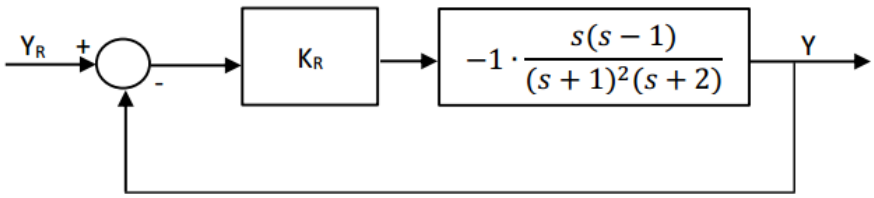
Za sistem prikazan na slici odrediti i predstaviti GMK ako je $K_R \leq 0$.



- ***Prijenosna funkcija:***

$$G_o(s) = K \cdot \frac{s(s-1)}{(s+1)^2(s+2)}$$

-I KORAK :

m=2 (m => broj nula prijenosne funkcije) $s_{N1}=0$ *=> prva nula* $s_{N2}=1$ *=> druga nula*

n=3 (n => broj polova prijenosne funkcije)

$s_{P1}=-1$ *=> prvi pol* $s_{P2}=-1$ *=> drugi pol* $s_{P3}=-2$ *=> treći pol*

-II KORAK:

$\sigma \epsilon (-\infty, -2] \cup \{-1\} \cup [0,1]$ => *tačke na realnoj osi koje pripadaju krivulji mjesta korijena*

-III KORAK:

$\sigma_a = \frac{1}{n-m}\{\sum_{v=1}^{n} Re(s_{Pv}) - \sum_{v=1}^{n} Re(s_{N\mu})\}$ => *tačka presjeka asimptota*

$$\sigma_a = \frac{1}{1}(-1-1-2-(0+1)) = -5$$

-IV KORAK:

$\alpha_k = \frac{180(2k+1)}{n-m}$, $k = 1, 2, \dots, n-m$ => *ugao asimptote*

$$\alpha_1 = \frac{180(2-1)}{1} = 180°$$

-V KORAK :

$\sum_{v=1}^{n} \frac{1}{s-s_{Pv}} = \sum_{\mu=1}^{m} \frac{1}{s-s_{N\mu}}$ *=> tačke grananja / tačke sjedinjenja*

$$\frac{1}{s} + \frac{1}{s-1} = \frac{1}{s+1} + \frac{1}{s+1} + \frac{1}{s+2}$$

$$(s^2-1)(s+2) + (s^2+s)(s+2) = (2s^2-2s)(s+2) + s(s^2-1)$$

$$s^3 + 2s^2 - s - 2 + s^3 + 2s^2 + s^2 + 2s = 2s^3 + 4s^2 - 2s^2 - 4s + s^3 - s$$

$$s^3 - 3s^2 - 6s + 2 = 0$$

$s_1 = \sigma_{V1} = -1.5842$ *=> ne pripada intervalu (σ)*

$s_2 = \sigma_{V2} = 0.29428$, *=> pripada intervalu - tačka sjedinjenja*

$s_3 = \sigma_{V3} = 4.2899$ *=> ne pripada intervalu (σ)*

-VI KORAK:

$$\varphi_{I,k}(s_{Pi}) = \frac{1}{r_{Pi}}\left(\sum_{\mu=1}^{m} < (s_{Pi} - s_{N\mu}) - \sum_{\substack{v=1 \\ v\neq i}}^{n} < (s_{Pi} - s_{N\mu}) + 180(2k-1)\right), k = 1, \dots, r_{Pi}$$

$$\varphi_{U,k}(s_{Ni}) = \frac{1}{r_{Ni}}\left(\sum_{v=1}^{n} < (s_{Ni} - s_{Pv}) - \sum_{\substack{\mu=1 \\ \mu\neq i}}^{m} < (s_{Ni} - s_{Nv}) + 180(2k-1)\right), k = 1, \dots, r_{Ni}$$

$$\varphi_{I,1}(s_{P1}) = \frac{1}{2}(180 + 180 - (0+0) + 180) = -90°$$

$$\varphi_{I,2}(s_{P2}) = \frac{1}{2}(180 + 180 - (0+0) + 180 \cdot 3) = 90°$$

$$\varphi_{I}(s_{P3}) = \frac{1}{1}(180 + 180 - (180+180) + 180) = 180°$$

$$\varphi_{U}(s_{N1}) = \frac{1}{1}(0 + 0 + 0 - 180 + 180) = 0°$$

$$\varphi_{U}(s_{N2}) = \frac{1}{1}(0 + 0 + 0 - 0 + 180) = 180°$$

a_n=1

a_{n-1}=K+4

a_{n-2}=5-K

a_{n-3}=2

s^3	1	5-K
s^2	4+K	2
s^1	$-K^2+K+18$	0
s^0	0	0

$4+K=0$

K=-4

$-K^2+K+18=0$

K_1=-3,77

K_2=4,77

W=$\sqrt{\frac{2}{8,77}}$=0.47

```
G=tf([1 -1 0],[1 4 5 2]);
rlocus(G);
```