1. Determine the stability of the following closed-loop polynomials by utilizing Routh's stability criterion. If the system is unstable, determine the poles that lie in the right-half s plane.

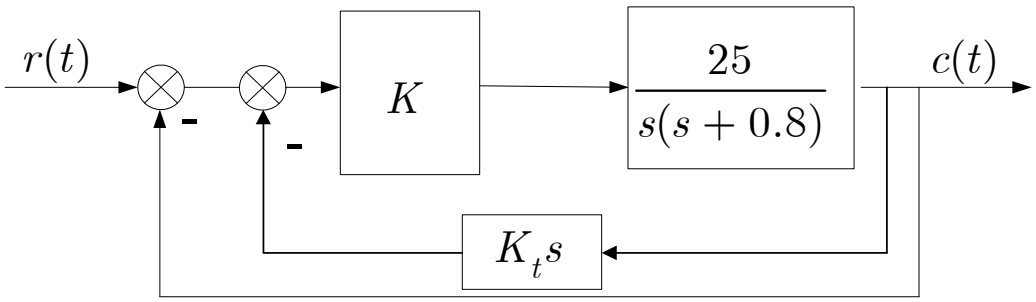
1) $s^3+20s^2+9s+100=0$

2) $3s^4+10s^3+5s^2+s+2=0$

3) $s^4+3s^3+5s^2+3s+1=0$

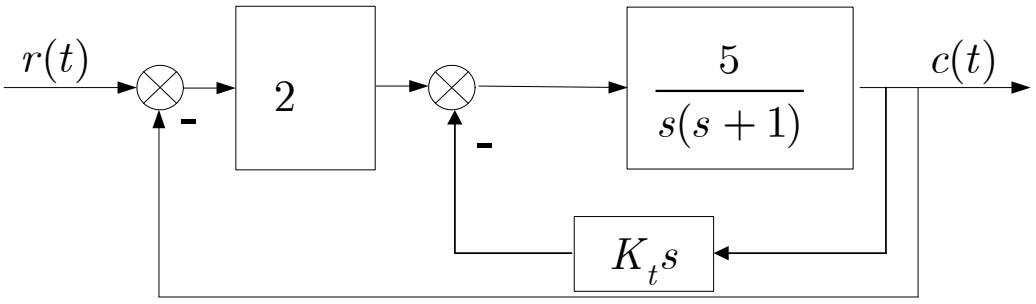
4) $s^3+10s^2+16s+160=0$

2. The following block diagram represents a simplified aircraft control system:



Determine K and K_t, so that ω_n=6/s and ζ=1. Based on the evaluated K and K_t, determine the system settling time t_s.

3. System block diagram is shown below



If it is required that ζ=0.6, determine the value of K_t and the corresponding t_p, t_s and M_p.

4. B-5-20, B-5-21, B-5-22, B-5-23