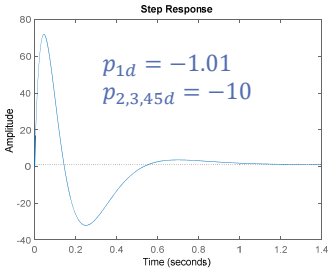
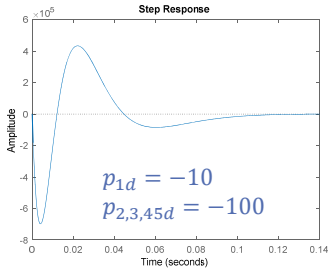
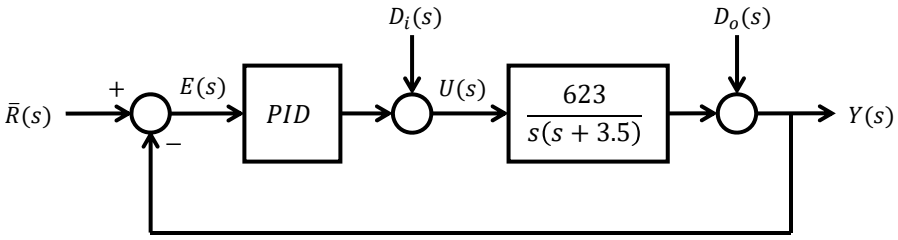
SANDEEP ASKED SOMETHING LIKE "WHICH APPEARS FIRST IN A STEP RESPONSE, UNDERSHOOT OR OVERSHOOT?"





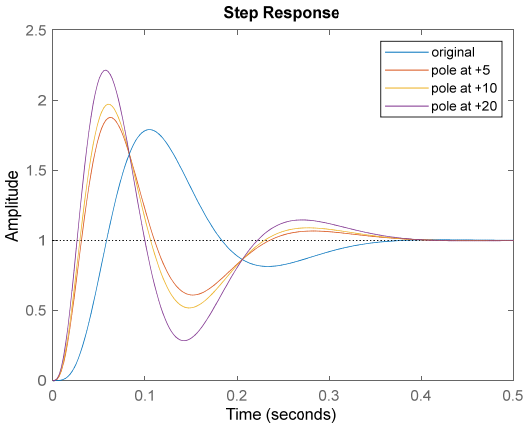
USE THE SAME EXAMPLE SYSTEM AS BEFORE



$$C_o(s) = \frac{8.3s^2 + 205s + 2054}{s(s + 117)}$$

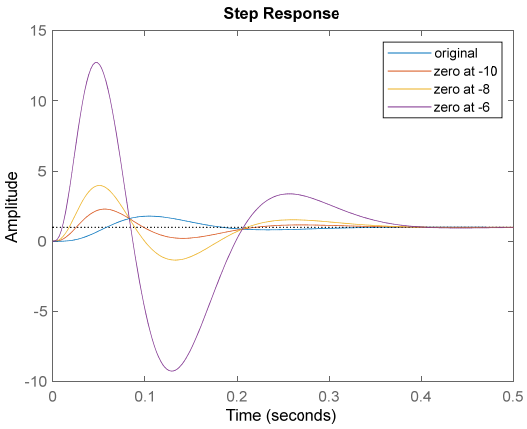
- Assume CL poles at -20+/-20j with additional poles at -40

AN ADDITIONAL RHP OL POLE TO THE RIGHT OF THE CL POLES PRODUCES OVERSHOOT



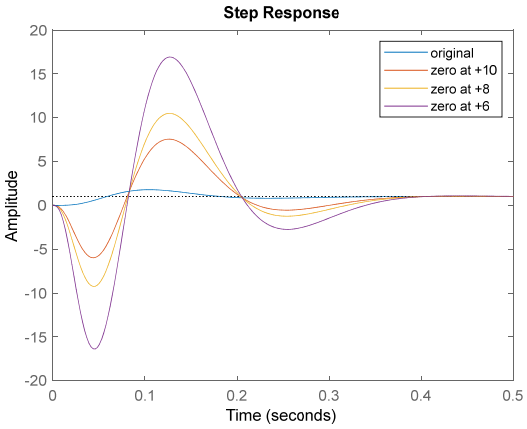

```
ans =

     623
  ---------
  s (s+3.5)

Continuous-time zero/pole/gain model.


ans =

        623
  ---------------
  s (s-5) (s+3.5)

Continuous-time zero/pole/gain model.


ans =

        623
  ----------------
  s (s-10) (s+3.5)

Continuous-time zero/pole/gain model.
```


AN ADDITIONAL LHP OL ZERO TO THE RIGHT OF CL POLES PRODUCES OVERSHOOT



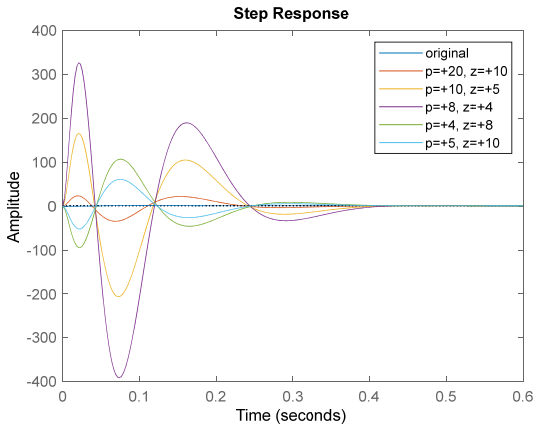

```
ans =

  623 (s+10)
  ----------
  s (s+3.5)

Continuous-time zero/pole/gain model.


ans =

  623 (s+8)
  ---------
  s (s+3.5)

Continuous-time zero/pole/gain model.


ans =

  623 (s+6)
  ---------
  s (s+3.5)

Continuous-time zero/pole/gain model.
```

AN ADDITIONAL RHP OL ZERO TO THE RIGHT OF CL POLES PRODUCES OVERSHOOT




```
ans =

  623 (s-10)
  ----------
  s (s+3.5)

Continuous-time zero/pole/gain model.


ans =

  623 (s-8)
  ---------
  s (s+3.5)

Continuous-time zero/pole/gain model.


ans =

  623 (s-6)
  ---------
  s (s+3.5)

Continuous-time zero/pole/gain model.
```


WHAT ABOUT THE COMBINATION OF RHP OL POLE AND ZERO?



WHAT ABOUT THE COMBINATION OF RHP OL POLE AND ZERO?