

ECE 461 - Homework Set #4

LaPlace Transforms, 1st and 2nd Order Approximations, Block Diagrams. - Due Monday, September 28th

1) For the following system

$$Y = \left(\frac{100}{(s+2)(s+5)(s+20)} \right) U$$

1a) Find a 1st order approximation which has almost the same step response

1b) Plot the step response of the 3rd-order system and its 1st-order approximation.

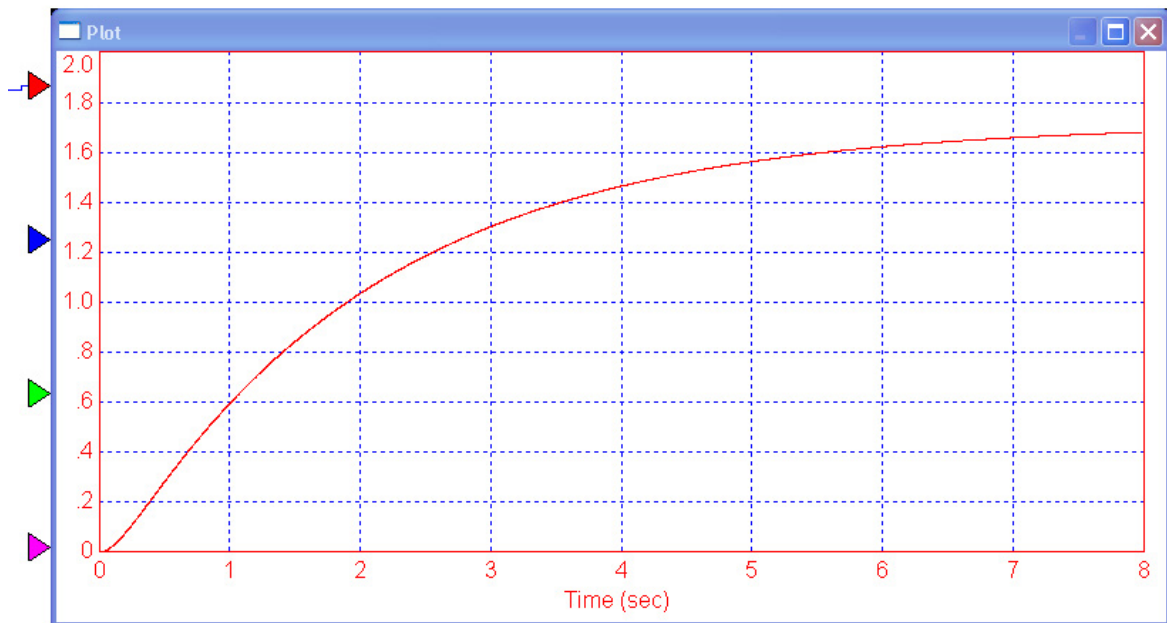
2) For the following system

$$Y = \left(\frac{1000}{(s+1+j/4)(s+1-j/4)(s+30)(s+50)} \right) U$$

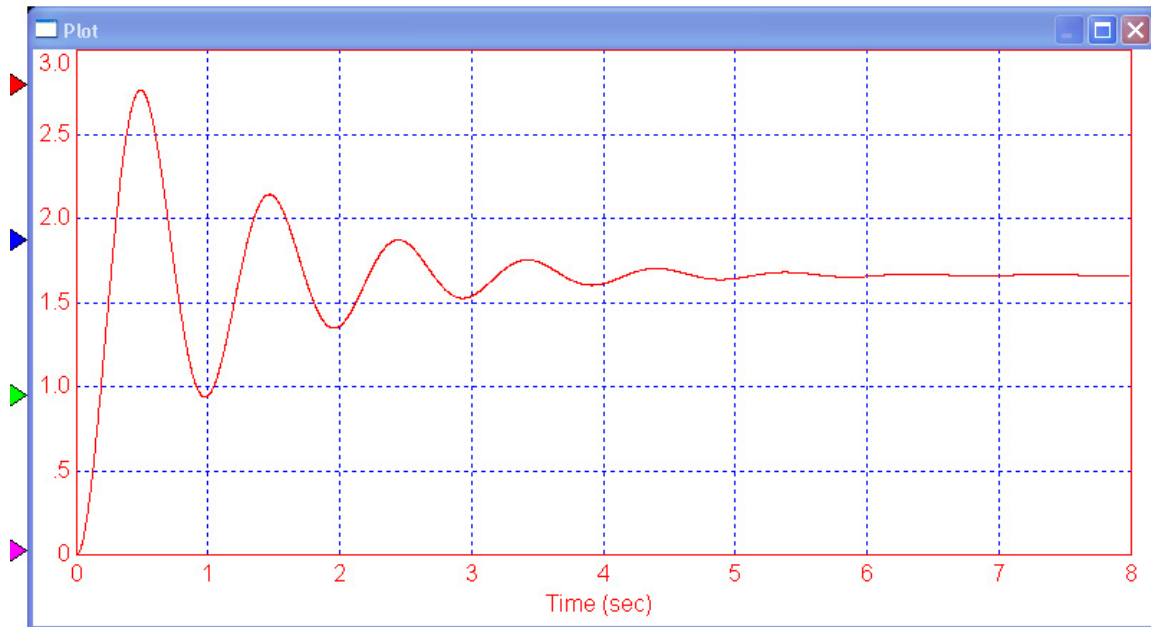
2a) Find a 2nd order approximation which has almost the same step response

2b) Plot the step response of the 4th-order system and its 2nd-order approximation.

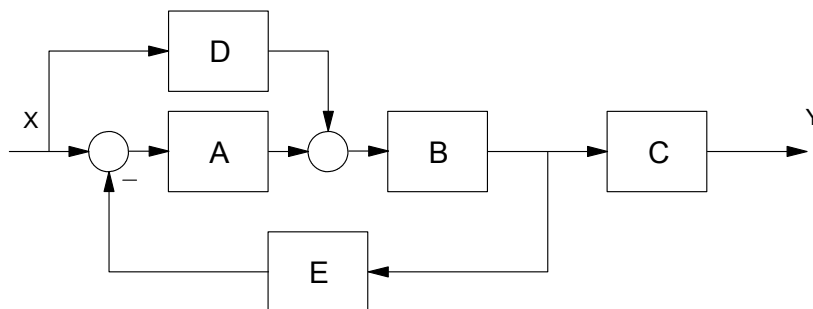
3) Find the transfer function for a system with the following step response.



4) Find the transfer function for a system with the following step response.



5) For the following block diagram, determine the transfer function from X to Y



6) For the following block diagram, determine the transfer function from X to Y

