file: g:\coursesF18\610\BttDuff\_calc.mcd 10/26-29/18

check for PR poles/zeroes

























































plot real part of y(jω ) = G(x); x=ω ^2



A guess at x to give the minimum G(x) is xMin=2.



calculate and plot derivative of G(x); x=ω ^2



use mathcad root solver to find 0 of derivaive of G(x) to get minimum(G(.));

Above gives a guess of xMin=2 but use x1=1.8 to exhibit solver ability



guess value = x1





xroot = ω ^2 where the real part of y(jω )=0 to create a pole or zero of Richards function













Calculate the numerator coefficients of y1(s) and set the minimum admittance ym(s)=y1(s) with these coefficients

















Search for k to give a zero of the Richards function; call k1 as it will be a vector for

plotting to allow k to be a scalar





















plot k1y(k1) and K(ω 0) to get a real zero



Use another root solver to find the k value, kz, to give N(kz) or D(kz) = 0









Form Richards' admittance











Therefore k=kz forces a factor of yr at s=jω o and its conjugate as well as s=kz

Form Richards' admittance











Therefore k=kz forces a factor of yr at s=jω o and its conjugate as well as s=kz

Coeffiients for yr(s,k)





































factored this becomes















For the example: y(s)=[5s^2+4s+8]/[2s^2+s+2] this gives G(ω 0^2)=2 and ω 0=sqroot(2);

ym(s)=y(s)-2=[s^2+s+4]/[2s^2+s+2] and kz=2 to give ym(kz)=1, and

the Richards' admittance yrf(s)=(s^2+2)/(2s^2+3s+4)=(s^2+2)/([s^2+2]+3s)

or yrf(s)=1/[1+(3s/(s^2+2))]