

610 Fall 2015 – Homework 5 Due Th 10/15/15

1. (60 points, Foster & Cauer synthesis)
 - a) For the following lossless admittance give the two Foster and the two Cauer realizations.
$$y(s) = \frac{3s(s^2+3)}{(s^2+1)(s^2+4)}$$
 - b) Comment on the differences.
 - c) Sketch $[y(j\omega)]/j$
 - d) Redo the second Foster if the 3 is replaced by -3 in the above and comment on the result.

2. (40 points, reflection coefficient properties)
 - a) Give the scattering matrix (=reflection coefficient), $S(s)$, for the above PR $y(s)$.
 - b) Check that $S(s)$ is bounded real.
 - c) Give the poles and zeros of $S(s)$ and compare their locations with those of $y(s)$.