Problem 1

For each of the following transfer functions:

a) \[ G(s) = \frac{10}{s(s + 2)(s + 5)} \]

b) \[ G(s) = \frac{(s + 10)}{(s + 1)(s + 50)} \]

c) \[ G(s) = \frac{s(s + 30)}{(s^2 + 5s + 25)} \]

i) Derive the analytical expressions for magnitude and phase angle as a function of the excitation frequency

ii) On appropriate graph paper (log - log or semi-log) create asymptotic sketches of each of the above transfer functions

iii) Use the analytical expressions to determine the exact values for gain only at the breakpoints.