

Department of Mechanical Engineering  
Cleveland State University

MCE 441: Introduction to Linear Control Systems  
MCE 541: Linear Control Systems  
Homework 5 - Fall 2009

**OUT: 11-10-09. DUE: 11-18-09**

1. (MCE441: 50 pts, MCE541: 30 pts)

For the transfer function

$$G(s) = \frac{4(s + 2)}{s(s^2 + 0.01s + 5)(s + 10)}$$

Hand-sketch the Bode plot (magnitude and phase). Clearly indicate all relevant break frequencies and slopes. Show all auxiliary calculations. Find the height of any resonant peaks for a better sketch.

2. (MCE441: 50 pts, MCE541: 70 pts)

Find a transfer function that accurately fits the Bode plot of the figure. Show all auxiliary calculations. Include a computer-generated Bode plot of your transfer function.

# Bode Diagram

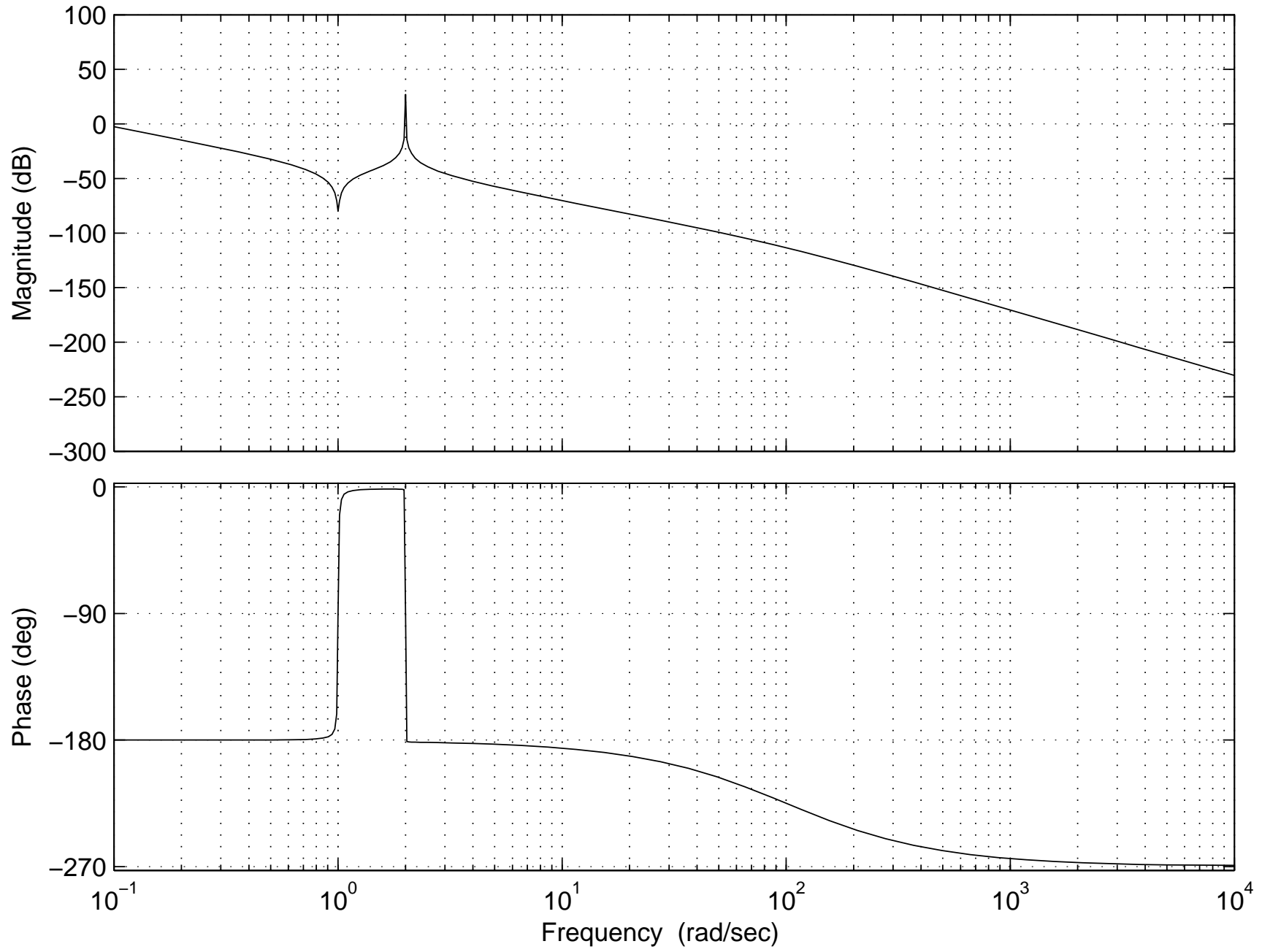


Figure 1: Bode plot of mystery TF