**HW3 Report**

System 1 – Not Homogeneous

While the linear I/O plot passes through the origin, it is not a straight line. This is easier to see on the linear gain plot, which shows that gain is not constant, instead resembling a square root function. The log I/O plot is not parallel to the unity line, and again the gain graph shows that gain is not constant.





System 2 – Not Homogeneous

A graph with a line

Description automatically generatedA graph of a line

Description automatically generatedAgain, the linear I/O plot passes through the origin but is not a straight line, while the log I/O is not parallel to the unity line. The linear gain plot shows highly compressive growth, not constant gain, and the log gain plot also is not constant.

A graph of a line

Description automatically generatedA graph of a function

Description automatically generatedSystem 3 – Homogeneous

A graph with a line

Description automatically generatedA graph of a function

Description automatically generatedThe linear I/O plot is a straight line that goes through the origin, and the log I/O plot is a line that is parallel to the unity line. Both gain plots show constant gain, which is required for a homogeneous system.

A blue and red line graph

Description automatically generatedA graph with a line

Description automatically generated

System 4 – Not Homogeneous

A graph of a function

Description automatically generatedA graph of a line

Description automatically generatedRather than straight lines, both the linear and log I/O plots show very sharp, segmented shifts alongside very flat lines. The gain plots also show these sharp shifts and are certainly not demonstrative of constant gain.

A graph of a function

Description automatically generatedA graph of a line

Description automatically generated