

Handout 12: Plants with right half-plane zeros

Eric Feron

March 15, 2004

The worst of all (but they exist)!

Example: The Star Market vs. Home Depot dilemma

Star Market cart: Casters mounted under cart front. $\dot{\theta}$ used to steer cart rear deviation y from reference lane.

$$G(s) = \frac{y}{\dot{\theta}} = \frac{1}{s^2}$$

Home Depot cart: Casters mounted under cart back. Use again $\dot{\theta}$ to steer cart rear deviation y from reference lane.

$$G(s) = \frac{y}{\dot{\theta}} = \frac{1-s}{s^2}$$

Root-locus and frequency responses:

Star Market:

Home Depot:

Design lead compensation for Star Market

Home Depot