Example

$$G(s) = \frac{1}{(s + 0.2)(s + 0.5)} \overset{\substack{\text{Bode} \\ \text{form}}}{=} \frac{10}{\left(\frac{s}{0.2} + 1\right)\left(\frac{s}{0.5} + 1\right)}$$

Objectives:

- PM $\geq 60°$
- $e(\infty) \leq 10\%$ for constant reference (closed-loop tracking error)

Strategy:

- we will use lag

$$KD(s) = K\frac{s + z}{s + p}, \qquad z \gg p$$

- z and p will be chosen to get good tracking
- PM will be shaped by choosing K
- this is different from what we did for lead (used p and z to shape PM, then chose K to get desired bandwidth spec)