Homework 5: Steady-State and Transient Response

Note: This homework assignment is due on Thursday 22.03.2012, 15:40.

Problem 9:

We are given the following transfer functions

$$G_1(s) = \frac{(s+3.5)(s+4)}{(s+3)(s+10)}$$

$$G_2(s) = \frac{s+8}{(s-3)(s+200)}$$

$$G_3(s) = \frac{s-4}{(s+4)(s^2+3s+3)}$$

$$G_4(s) = \frac{s+2}{(s+10)(s+20)}$$

- **a.** Determine the dominant pole for each of the transfer functions. Justify your choice in each case!
- **b.** Which of the transfer functions leads to undershoot in the step response?
- c. Which of the transfer functions leads to overshoot in the step response?

Problem 10:

We are given the transfer function $G(s) = \frac{2}{1+4s}$

- **a.** Determine the ramp response of G(s)
- **b.** Write down the steady-state response $y_{ss}(t)$ and the transient response $y_{tr}(t)$

Problem 11:

The following measurement of a step response is given. Determine the relevant performance parameters.

