Homework 2: Transfer Functions and Block Diagram Simplification

Note: This homework assignment has to be returned until Thursday 01.03.2012, 15:40.

Problem 2:

We consider a system with the following block diagram



We assume that the values K, T and τ are unknown. To determine these values, we apply an input step $u(t) = 2\sigma(t)$ to the system and obtain the output signal in the following figure.



Determine K, T and τ from the measurement!

Problem 3:

- a. Replace the operators in the block diagram of the active suspension system from Problem 1 c. by transfer functions
- **b.** Simplify the block diagram such that it has the form in the following figure. Write down the transfer functions G_1 and G_2 . What is the transfer function type of G_1 and G_2 ?



Problem 4:

A plant with the following block diagram is given. u is the input signal, y is the output signal and d is the disturbance signal.



Simplify the block diagram such that it has the form in the following figure. Write down the transfer functions $G_1(s)$ and $G_2(s)$ explicitly!

