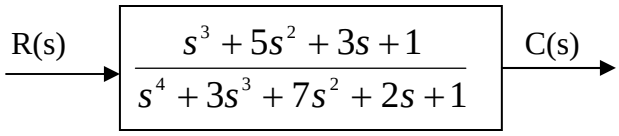
Concordia University
Department of Computer Science and Software Engineering

SOEN 385-Control Systems and Applications

Assignment No. 1
Due date: Tuesday February 1, 2011

The textbook referred to in this assignment is: Control Systems Engineering, 5th Edition, by N. S. Nise, John Wiley & Sons.

1) Write the differential equation that is mathematically equivalent to the block diagram shown below. Assume that $r(t) = t^5$



2) A system is described by the following differential equation:

$$\frac{d^2y}{dt^2} + 12\frac{dy}{dt} - 7y = 3$$

With the initial conditions: $y(0) = 1, y' = -1$. Show a block diagram of the system, giving its transfer function and all pertinent inputs and outputs. *Hints*: the initial conditions will show up as added inputs to the system with zero initial conditions.

3) Do problem 14, page 95 of the textbook.

4) Do problem 16, page 95 of the textbook.

5) Do problem 28 part (a), page 97 of the textbook.

6) Do problem 50, page 100 of the textbook