Part II Problems

Problem 1: [Step and delta responses]

(a) Find the unit impulse response w for the LTI operator $2D^2 + 4D + 4I$.

(b) Find the unit step response v for the same operator.

(c) Verify that $\dot{v} = w$ (as it should be, since $\dot{u} = \delta$).

(d) For each of the following functions, find the LTI differential operator $p(D)$ having it as unit impulse response.

(i) $2u(t)$.

(ii) $u(t)t$.

(iii) $u(t)t^2$.

18.03SC Differential Equations
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