CSE 351 – Signals and Systems, Spring 2020
Homework # 2
Due Date: May 6, 2020
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Problems:

1. **[50 points]** Consider a system with the following transfer function,

   $H(s) = (2s+3) / (s^2+5s+6)$

   a. Determine it's zero-state response if the input $f(t) = e^{-3t}u(t)$.
   b. Write down the differential equation relating output y(t) to the input f(t).
   c. Find the inverse Laplace transform of $(s+2) / s(s+1)^2$.

2. **[30 points]** For a an LTID system with the following differential equation,

   $2y[k+2]-3y[k+1]+y[k] = 4f[k+2]-3f[k-1]$,

   Find the output y[k] if the input is $f[k] = (4)^{-k}u[k]$ and initial conditions are $y[-1] = 0$ and $y[-2] = 1$.

3. **[20 points]** Find the inverse z-transform of $z(-5z+22) / (z+1)(z-2)^2$.