6. (4 Points.) Consider the system

\[ x' = \begin{pmatrix} 1 & 2 \\ 2 & 1 \end{pmatrix} x + \begin{pmatrix} g(t) \\ 0 \end{pmatrix}, \quad x(t) = \begin{pmatrix} x(t) \\ y(t) \end{pmatrix}, \]

and assume that \( x(t) \) and \( y(t) \) satisfy the initial conditions \( x(0) = 0 \) and \( y(0) = 1 \). Let \( g(t) \) be a function having a Laplace transform denoted \( G(s) \), for \( s \) large enough. Find \( X(s) = \mathcal{L}\{x(t)\} \) and \( Y(s) = \mathcal{L}\{y(t)\} \) in terms of \( G(s) \). Your answers should be in terms of \( s \).