Name: _____

1. [**2 parts, 2 points each**] Compute the following.

   (a) $\mathcal{L}\left\{u_{\pi/2}(t)\sin(3t)\right\}$

   (b) $\mathcal{L}^{-1}\left\{\dfrac{e^{-6s}}{s^2+4}\right\}$

2. Compute the inverse of $\begin{bmatrix} -3 & 4 & -6 \\ -1 & 1 & -2 \\ -4 & 1 & -7 \end{bmatrix}$.

3. [**4 points**] Use the Laplace transform to solve $y'' + 5y' - 14y = g(t)$, where $g(t) = \begin{cases} 1 & \text{if } t < 4 \\ 0 & \text{if } t \geq 4 \end{cases}$

   with $y(0) = y'(0) = 0$.