Homework 1 - due Mon Jan 26.

1. Let $u(x, y) = e^{y^2 x}$. Find
$$\frac{\partial^5 u}{\partial x^5}, \quad \frac{\partial^2 u}{\partial y^2}.$$
Show all steps.

2. Calculate
$$\int_0^A te^{-bt}\, dt.$$
Show all steps.

3. Find
$$\det \begin{pmatrix} 1 & A \\ 2 & B \end{pmatrix}.$$

4. Solve the initial value problem,
$$y'' - 4y' + 5y = 0, \quad y(0) = 1, \quad y'(0) = 2.$$
Show your work.