Quiz 2

Each question is worth 25 points. Please write detailed mathematically correct solutions.

You are not required to check the linear independence of the solutions you get. For the following problems let

$$L[y] = y'' + 2y$$

1. Using variation of parameters find the general solution of

$$L[y] = 1$$

2. Find the general solution of

$$L[y] = 2e^{-t}\cos t + 7e^{-t}\sin t$$

3. Suppose that a particular solution of

$$L[y] = b(t)$$

is given by $y_p(t)$. Assuming this, which of the following DE's can you solve? Write down the general solutions of the ones you can,

$$L[y] = -2b(t)$$
$$L[y] = 1 + b(t)$$
$$L[y] = b(t)^2 - 2b(t) + 1$$

4. Given that one solution of the DE

$$y'' + p(t)y' + q(t)y = 0$$

is $y_1(t)$ find the other solution. (Your final answer should be in terms of integrals involving y_1, p, q.)