MATH 2120 – Quiz 4 Thursday October 23, 2014

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1. Find the particular solution of the equation

$$y'' + 4y = 2\sin^2 x\,.$$

2. Write down the form of the particular solution of the equation

$$y'' - 7y' + 10y = x^3\, e^{5x} + x^2\,.$$

Do not solve for the coefficients.

3. Variation of parameters states that the particular solution of $y'' + p(t)\, y' + q(t)\, y = f(t)$ is given by

$$y_p(t) = y_1(t) \int \frac{-y_2(t) f(t)}{W(y_1, y_2\,; t)}\, dt + y_2(t) \int \frac{y_1(t) f(t)}{W(y_1, y_2\,; t)}\, dt\,, \tag{1}$$

where $W(y_1, y_2\,; t)$ is the Wronskian of the two linearly independent homogeneous solutions $y_1(t)$ and $y_2(t)$. For the equation

$$y'' + 9y = \cos 3t\,,$$

set up the two integrals in (1). Choose **one** to evaluate.