

MATH 246 Homework 2.5 & 2.6

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Directions:

- Work should be done neatly and on separate paper.
 - Enough work must be shown so that the steps you are taking is clear.
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1. For each of the following first show that $Y_P(t)$ is a solution to the differential equation and then find the general solution.

(a) $y'' - 6y' + 34y = 33 \cos t + 6 \sin t$ with $Y_P(t) = \cos t$.

(b) $y'' - y' = 1 - 2t$ with $Y_P(t) = t^2 + t$.

(c) $y'' + 6y' + 9y = 14 \cos t + 2 \sin t$ with $Y_P(t) = \sin t + \cos t$.

(d) $y'''' - 3y''' + 3y'' - y' = 18 - 6t$ with $Y_P(t) = t^3$.

2. Solve the following initial value problems. A solution to the differential equation is given.

(a) $y'' - y' = 1$ with $y(1) = 4$ and $y'(1) = 2$. DE solution $Y_P(t) = -t$.

(b) $y'' + 4y = 5e^t$ with $y(0) = 2$ and $y'(0) = -2$. DE solution $Y_P(t) = e^t$.

3. Using the Method of Undetermined Coefficients, write down the undetermined $Y_P(t)$ for each of the following.

(a) $y'' - 4y' + 3y = t^3$

(b) $y'' - 4y' = t^3 + 2t$

(c) $y'' - 4y' + 3y = e^{2t}$

(d) $y'' + 4y = e^t \cos(3t)$

(e) $y'' + 4y = 42e^t + (t^2 - t) \cos(2t)$

(f) $y'' - 4y' + 3y = 2 + e^t$