Differential Equations - Advanced Problem Set 5

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Directions: Do the following book problems

Chapter 3.5 Problems 58, 59 - First confirm the homogeneous solution $y_c = y_h$ given in the problem by solving directly using the substitution $v = ln(x)$. Then find the nonhomogeneous solution using variation of parameters.
Chapter 3.8 Problem 6

Other Notes:

1. Don't forget that to use Variation of Parameter you must have a one as the leading term in front of y''.
2. In equidimentional equations like 58 and 59, you notice that the term $ln(x)$ is used to remove duplications! An interesting shortcut in these problems is instead of using $v = ln(x)$ you could just assume a solution of the form $y = x^r$, plug in and solve! But you have to memorize some different rules for duplications and complex numbers.