

Math 307 - Differential Equations - Spring 2017

Quiz 7

March 23, 2017

Name: Solutions

Problem 1. Write down what you should guess for the particular solution using the method of undetermined coefficients in each of the following situations

(a) $y'' - 2y' - 3y = e^{3x}(1+x)$

$$r^2 - 2r - 3 = (r-3)(r+1) = 0 \Rightarrow r = 3, -1$$

Guess $y_p = x e^{3x} (A_0 + A_1 x)$

(b) $y'' + 3y' + 2y = \cos x - 2 \sin x$

$$r^2 + 3r + 2 = (r+2)(r+1) = 0 \Rightarrow r = -2, -1$$

Guess $y_p = A \cos x + B \sin x$

(c) $y'' + 16y = x + e^{-x} + \cos 2x$

$$r^2 + 16 = 0 \Rightarrow r = \pm 4i$$

Guess $y_p = A_0 + A_1 x + B e^{-x} + C \cos 2x + D \sin 2x$