Math 2243 Fall 2015 - Quiz 8- Rubric

11/19/15 - 10 Minutes **Name:**

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(1) (5 Points) Set up an appropriate particular solution y_p, for the differential equation,

$$y^{(3)} - y'' - 12y' = x - 2xe^{-3x}$$

which have complementary function given by;

$$y_c = C_1 + C_2e^{-3x} + C_3e^{4x}$$

(Do not determine the values of coefficients).

- (1pt.) Any work
- (2 pt.) Initial guess is true; $(A + Bx) + (C + Dx)e^{-3x}$
- (2pt.) Multiplying by x and saying $y_p = x.(A + Bx) + x.(C + Dx)e^{-3x}$
  (if student forgets to multiply two of those terms by x, consider giving 1 partial credit for this case)

(2) (5 Points) Solve the initial value problem;

$$y'' + 4y = 2x\,; \quad y(0) = 1\ , y'(0) = 2$$

whose particular solution is given by;

$$y_p = \frac{x}{2}.$$

- (2 pt.) Finding $y_c = c_1 cos2x + c_2 sin2x$
- (1 pt.) Saying $y_g = c_1 cos2x + c_2 sin2x + x/2$
- (2 pt.) Computing $c_1 = 1$ and $c_2 = 3/4$ (for each small algebra mistakes, if the rest of it true, you can deduct 1pt)