Math 222 Quiz 8

Nov. 4, 2010

Your Name: *Your Section:*

Instructions: Time is 20 minutes and the total score is 10 points. There are bonus problems. **To do well in Math, please read the textbook.**

1. Solve the differential equation with initial value $y(1) = 0$: $y' - \frac{y}{x} = x + 1$ (3 pts)

2. (a). Find the solution: $8y''(t) + 8y'(t) + 2y(t) = 0$ and $y(0) = 0$, $y'(0) = 1$ (4 pts)
   (b). Find the general solution to $y'' + 2y' + 4y = 0$. y is a function of x(3 pts)

Bonus: Choose **ANY ONE** below: (4 pts)

• a). If y_1 and y_2 are solutions to $y'' - 5y' + 6y = 0$, how about $y_1 + y_2$? (1 pt). If the equation is $y'' - 5y' + 6 = 0$, what's the answer? (1 pt)

b). If I tell you that two solutions to the equation $x^2y'' - 5xy' + 9y = 0$ are of the type $y_1 = x^r$ and $y_2 = x^r \ln x$, which are obviously linearly independent, find r (1 pt) and write out the general solution (1 pt)

• Solve $2(yy')' - 10yy' + 6y^2 = 0$ (2 pts) and $y'' - 5y' + 6 = 0$ (2 pts).

Hint: Both equations need substitution. For the second, you can regard y' as a whole first and then solve y.