

**QUIZ IV:MATH 274**

March 8, 2012.

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1. [8pts] Solve the following (Cauchy-Euler) initial value problem:

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

2. [7pts] Use the method of variation of parameters to find a particular solution  $y_p(x)$  of

$$y'' + y = \sec x$$

**3.** [5pts] The function  $y_1(x) = \sin(x)^2$  is a homogeneous solution of

$$y'' + \tan x y' - 2 \cot(x)^2 y = 0$$

Use reduction of order to find a second independent solution  $y_2(x)$  and then state the general solution of the differential equation.