Prof. A. Suciu **Name:** _____

MTH 1733 # QUIZ 3 **Fall 1997**

1. [6 points] For each of the following curves, determine the equations of the asymptotes, if any:

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

   (b) $y = \ln(x^2 - 4)$

   (c) $y = e^{-x^2}$

2. [6 points] Differentiate the following functions:

   (a) $y = x\sqrt{\ln x}$

   (b) $y = e^{e^{x^2}}$

   (c) $y = \dfrac{e^x + 1}{x^e - 1}$

3. [8 points] Solve the following initial value problem:

$$y'' - 9y = 0, \quad y(0) = 8, \quad y'(0) = 2.$$

4. [10 points] For each of the following non-homogeneous differential equations with constant coefficients, write down the general form of the solution. You may leave the undetermined coefficients of the particular solution unevaluated, as in the following example.

$y' + y = 2x + 3$ Solution: $y_h = C_1 e^{-x}, \quad y_p = Ax + B, \quad y = y_h + y_p.$

(a) $y' - 3y = 4x^3 - 5x^2$

(b) $y' - 3y = e^{3x} + x + 3$

(c) $y' - 3y = 2e^{-3x} - 3e^{2x}$

(d) $y'' - y' = e^x$

(e) $y'' - y' = 1$