

NAME: Abdon MoralesEID: am226923

Quiz 3 427J

1. Consider the O.D.E.

$$y'' + 2y' - 3y = 0$$

(a) What is the characteristic polynomial for the O.D.E.?

$$y'' + 2y' - 3y \mapsto r^2 + 2r - 3 = 0$$

(b) What are the roots of the characteristic equation from part a)?

$$r^2 + 2r - 3 = 0 \rightarrow (r+3)(r-1) = 0$$
$$\left. \begin{array}{l} r+3=0 \\ r-1=0 \end{array} \right\} \rightarrow \boxed{r = -3, 1}$$
$$\left. \begin{array}{l} r = -3 \\ r = 1 \end{array} \right\}$$

(c) What is the general solution to the O.D.E.?

$$y(t) = C_1 e^{-3t} + C_2 e^t \iff y = C_1 y_1 + C_2 y_2$$

where

$$y_1 = e^{-3t}, y_2 = e^t$$