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**TEST # 3:**

Please show all your work in the test. Guessed answers are NOT acceptable. Open book. You may use calculators. Good luck!

(50 pt) 1) Solve the following initial value problem using the Laplace transform technique:

$$y'' + 9y = f(t)$$

$$y(0) = 0$$

$$y'(0) = 0$$

with

$$f(t) = \begin{cases} 1, & 0 \leq t < \pi \\ 0, & \pi \leq t \end{cases}$$



(50 pt) 2) Find a series solution about  $x = 0$  with a general formula for the coefficient  $a_n$  for the following differential equation:

$$y'' - x y' = 0$$

