Applied Differential Equations 2250-1
Midterm Exam 1 In-Class
Wednesday, 29 January, 2003

**Instructions:** This in-class exam is 15 minutes. Hand-written or computer-generated notes are allowed, including xerox copies of tables or classroom xerox notes. Calculators are allowed. Books are not allowed.

5. **(Linear Equations)**
   
   (a) Solve $10v' = -98 - 49v$, $v(0) = 47$.
   
   (b) Solve $y' = v(t)$, $y(0) = 10$, where $v(t)$ is the answer from (a).
   
   (c) Determine $t$ when $y(t)$ is a maximum.
   
   (d) Find the limit of $v(t)$ at $t = \infty$.

Reference: This is a special case of the kinematics problem $my'' = -mg - ky'$, $y(0) = 0$, $y'(0) = v_0$. 

5. (Linear Equations)
   (a) Solve \( v' = -32 - 2v \), \( v(0) = 90 \).
   (b) Solve \( y' = v(t) \), \( y(0) = 10 \), where \( v(t) \) is the answer from (a).
   (c) Determine \( t \) when \( y(t) \) is a maximum.
   (d) Find the limit of \( v(t) \) at \( t = \infty \).

Reference: This is a special case of the kinematics problem \( my'' = -mg - ky' \),
\( y(0) = 0 \), \( y'(0) = v_0 \).
Applied Differential Equations 2250-2
Midterm Exam 1 In-Class Version M-Z
Wednesday, 29 January, 2003

Instructions: This in-class exam is 15 minutes. Hand-written or computer-generated notes are allowed, including xerox copies of tables or classroom xerox notes. Calculators are allowed. Books are not allowed.

5. (Linear Equations)
   (a) Solve \( v' = -32 - 4v, \ v(0) = 95. \)
   (b) Solve \( y' = v(t), \ y(0) = 10, \) where \( v(t) \) is the answer from (a).
   (c) Determine \( t \) when \( y(t) \) is a maximum.
   (d) Find the limit of \( v(t) \) at \( t = \infty. \)

Reference: This is a special case of the kinematics problem \( my'' = -mg - ky', \ y(0) = 0, \ y'(0) = v_0. \)