MATH2860 - Elementary Differential Equations, Spring 2014

Quiz 1 – Solution

Jan 22, 2014

Printed NAME

- You have 10 min to complete your quiz
- Please show all your work neatly and indicate your final answers clearly If you simply write down the final answer without appropriate intermediate steps, you may not get full credit for that problem
- The quiz is closed book and notes **Calculators are not allowed**

GOOD LUCK :)

1 (5 points)Verify that

$$y = 3t + t^2$$

is a solution of the following ordinary differential equation

$$ty' - y = t^2$$

on R

Solution

observe that ① $\begin{cases} y = 3t + t^2 \text{ is defined on } \mathbb{R} \\ y' = 3 + 2t \text{ is also defined on } \mathbb{R} \end{cases}$

Substitution of ① into $ty' - y$

leads to $t(3+2t) - (3t + t^2) =$

$3t + 2t^2 - 3t - t^2 = t^2$

which is precisely the right hand side of $ty' - y = t^2$. Thus, the function $y = 3t + t^2$ is a solution on $\mathbb{R}$