

Mid Semester Exam #2 - Make Up

Math 3350: Higher Mathematics for Engineers and Scientists I

Fall 09 - Section 012

- Time allowed: 1 hour 20 minutes.
- This is an open book exam.
- Answer all questions.
- Show all the necessary work to earn full credit.
- Answers written on the test paper will not be graded.
- Please print your name on the first page of your answer scripts.
- Write your name on all the pages

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(1) Solve for  $y(t)$ , where  $\ddot{y}(t) + 2\dot{y}(t) + 2y(t) = e^{-t}$ ;  $y(0) = \dot{y}(0) = 0$ .

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(2) Solve the following Bernoulli's equation:

$$\frac{dy}{dx} + x^n y = x^n y^2. \quad \text{Where } n \text{ is a fixed integer with } n \geq 1.$$

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(3) (a) Verify if the form given below is exact:

$$e^x (\sin y + 2 \cos y) dx + e^x (\cos y - 2 \sin y) dy.$$

(b) Calculate  $f(x, y)$  such that  $df(x, y)$  is the above form.

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