

First letter (capitalized) of your last name.

Math 257, Section 201, Jan-April 2009

March 18, 2009

Midterm 2 (50 min)

Name: _____

Signature: _____

Student Number: _____

Calculators, books and notes are not allowed!

Pay attention: Be sure that this examination has 2 problems.

For partial credits you need to write intermediate steps!

P1		20
P2		20
Total		40

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Name: _____ Student Number: _____

Problem 1: (total 20pt) Consider the heat conduction problem

$$u_t = 4u_{xx}, \quad 0 < x < \pi, \quad t > 0$$

$$u(0, t) = \alpha, \quad u(\pi, t) = \beta$$

$$u(x, 0) = 2 \sin(3x)$$

- (a) Find the steady state solution $v(x)$ for $\alpha = 2$ and $\beta = 4$.
- (b) Find the solution $u(x, t)$ for $\alpha = 0$ and $\beta = 0$.

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extra page problem 1

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Problem 2: (total 20pt) Find the solution of the heat conduction problem

$$\begin{aligned}u_t &= 16u_{xx} - u, & 0 < x < 1, t > 0 \\u_x(0, t) &= 0, & u_x(1, t) = 0 \\u(x, 0) &= x\end{aligned}$$

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extra page problem 2