Dr. Z.'s Math 421(2), (Fall 2014, RU) REAL Quiz #1

NAME: (print!) _____

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1. Using the **definition** find the Laplace transform $\mathcal{L}\{f(t)\}$ (alias $F(s)$) of

$$f(t) = \begin{cases} -1, & \text{if } 0 \le t \le 2; \\ 1, & \text{if } t \ge 2. \end{cases}$$

2. Approximate, with mesh-size $h = 1$, the solution of the boundary-value problem

$$3u_{xx} + u_{yy} = 0 \quad , \quad 0 < x < 2 \quad , \quad 0 < y < 2 \quad ;$$

subject to the boundary conditions

$$u(0, y) = 1 \quad , \quad 0 < y < 2 \quad ; \quad u(2, y) = 2 \quad , \quad 0 < y < 2 \quad ;$$

$$u(x, 0) = -1 \quad , \quad 0 < x < 2 \quad ; \quad u(x, 2) = 3 \quad , \quad 0 < x < 2 \quad .$$