

MATH 2850: TEST 13 (25 points.)

NAME: _____

DUE: Wednesday, April 24th, at the beginning of class.

DIRECTIONS: Show all work.

1. Let $f(t) = \begin{cases} 5 & \text{if } 0 \leq t < 1 \\ 5t & \text{if } t \geq 1 \end{cases}$

(a) Write $f(t)$ in terms of Unit Step functions.

(b) Find $\mathcal{L}\{f(t)\}$ using your answer to part (a).

2. Find: $\mathcal{L}\{(t^2 - 3t)\mathcal{U}(t - 1)\}$

3. Find the following Inverse Laplace Transforms:

(a) Find $\mathcal{L}^{-1} \left\{ \frac{e^{-s}}{s^2 + \pi^2} \right\}$

(b) $\mathcal{L}^{-1} \left\{ \frac{e^{-\pi s} e^{2\pi}}{s^2 - 4s + 5} \right\}$