MATH 2850: TAKE HOME 12 (25 points.)

NAME: _____

DUE: Wednesday, April 17th, at the beginning of class.

DIRECTIONS: Show all work.

1. Solve the following IVP using the method of Laplace Transforms.

$$y'' + 4y' - 5y = 10,\ y(0) = 3,\ y'(0) = -13$$

2. Use the definition of Laplace Transform to show if $\mathcal{L}\{f(t))\} = F(s)$, then for $a > 0$,

$$\mathcal{L}\{f(at)\} = \frac{1}{a} F\left(\frac{s}{a}\right).$$

Verify this property by comparing $\mathcal{L}\{\sin(t)\}$ with $\mathcal{L}\{\sin(2t)\}$.