

**MATH 2850: TEST 11 (25 points.)**

**NAME:** \_\_\_\_\_

**DUE:** Wednesday, April 10th, at the beginning of class.

**DIRECTIONS:** Show all work.

1. Find the following Laplace Transforms:

(a)  $\mathcal{L}\{t^4 - 3t^2 + 4\}$

(b)  $\mathcal{L}\{3e^{-4t}\}$

(c)  $\mathcal{L}\{\cos(3t) - 2\sin(3t)\}$

(d)  $\mathcal{L}\{\cosh(3t) - 2\sinh(3t)\}$

2. Find the following Laplace Transforms using the Forward Shift Property:

(a)  $\mathcal{L}\{t^2 e^{-t}\}$

(b)  $\mathcal{L}\{e^{-4t} \cos(3t)\}$

(c) Let  $a > 0$  be a constant and  $f(t) = \begin{cases} 0, & \text{if } t < a \\ 1, & \text{if } t \geq a. \end{cases}$

Find  $\mathcal{L}\{f(t)\}$  using the integral definition of Laplace Transform.