

## MATH 2132 Problem Workshop 6

1. Compute the Laplace transforms of the following functions. For part (a) use the definition. For the others, you can use the table

(a)  $f(t) = e^{-2t} \cos 4t$

(b)  $f(t) = e^{-2t} \cos 4t h(t-3)$

(c)  $f(t) = \begin{cases} 2t-5 & 0 \leq t < 4 \\ t^2 & 4 \leq t < 8 \\ 1 & t \geq 8 \end{cases}$

(d)  $f(t) = t^2 - 2t + 3, \quad 0 \leq t < 2 \quad f(t+2) = f(t)$

2. Compute the inverse Laplace Transform for the following functions.

(a)  $F(s) = \frac{s^2 + 3}{s^3 + 2s^2 + s}$

(b)  $F(s) = \frac{e^{-s}(1 + e^{-2s})}{s^2 - s}$

(c)  $F(s) = \frac{1}{e^{2s}(s^3 + 2s^2 + 6s)}$

3. Is it possible for  $F(s) = \frac{s(s^2 + 3s - 6)}{4s^3 - 3s + 10}$  to be the Laplace transform for a piecewise continuous function of exponential order.