EE202 Homework 4

(1) Find Laplace transform of each of the following functions:

(a) $f(t) = \sin \omega t$
(b) $f(t) = \cos \omega t$
(c) $f(t) = e^{-at}$
(d) $f(t) = te^{-at}$
(e) $f(t) = 5\sin \omega t + 8\cos \omega t$
(f) $f(t) = 10\sin(\omega t + \pi/4)$
(g) $f(t) = t$
(h) $f(t) = t^2$

where a and ω are positive constants.

(2) Find the inverse Laplace transform of each of the following functions:

(a) $F(s) = \dfrac{1}{s}$

(b) $F(s) = \dfrac{1}{s^2}$

(c) $F(s) = \dfrac{1}{(s+a)^2}$

(d) $F(s) = \dfrac{1}{s+a}$

(e) $F(s) = \dfrac{\omega}{s^2 + \omega^2}$

(f) $F(s) = \dfrac{s}{s^2 + \omega^2}$

(g) $F(s) = \dfrac{\omega}{(s+a)^2 + \omega^2}$

(h) $F(s) = \dfrac{s+a}{(s+a)^2 + \omega^2}$

where a and ω are positive constants.