Problem 1

(a) Compute the phasors associated with three signals below.

$f_1(t) = 2 \sin (t + \frac{\pi}{6})$ $\quad F_1 =$ _____

$f_2(t) = -2 \cos t$ $\quad F_2 =$ _____

$f_3(t) = \sin 2t + \cos 2t$ $\quad F_3 =$ _____

Problem 2

(a) Convert each of the following time domain signals into phasor.

(i) $f_1(t) = 5 \sin\left(3t - \frac{\pi}{6}\right)$ $\quad F_1 =$ _____

(ii) $f_2(t) = \cos t + \sin t$ $\quad F_2 =$ _____

(b) Convert each of the following phasors into a time domain signal. Assume $\omega = 1$ rad/sec.

(i) $F_1 = 2 + 2j$ $\quad f_1(t) =$ _____

(ii) $F_2 = \dfrac{e^{j\pi/4}}{e^{-j\pi/2} + e^{j\pi/4}\left(1 + e^{j\pi/4}\right)}$ $\quad f_2(t) =$ _____

Problem 3

(a) Find the cosine function f(t) with frequency $\omega = 10$ rad/sec corresponding the following phasors.

(i) $F = (1+j)^3$ $\quad f(t) =$ _____

(ii) $F = e^{j\pi/4} + e^{-j\pi/4}(1 + \sqrt{2}\, e^{-j\pi/4})$ $\quad f(t) =$ _____

(b) Convert each of the following time domain signals into phasor form F.

i) $f_1(t) = \text{Cost} - \text{Sint}$

$F_1 =$ _____

ii) $f_2(t) = -2 \text{ Sin } 5t$

$F_2 =$ _____

iii) $f_3(t) = -3 \text{ Cos}\left(10t - \frac{\pi}{6}\right)$

$F_3 =$ _____

Problem 4

(a) If possible, convert the following signals into phasor form. If not possible, indicate why not.

i) $f_1(t) = \sqrt{3} \sin\left(3t + \frac{\pi}{2}\right)$

$F_1 =$ _____

ii) $f_2(t) = \cos(2t) + \sqrt{3} \sin\left(2t + \frac{\pi}{2}\right)$

$F_2 =$ _____

iii) $f_3(t) = \sqrt{3} \cos\left(t - \frac{\pi}{2}\right) + \sin\left(2t + \frac{\pi}{2}\right)$

$F_3 =$ _____