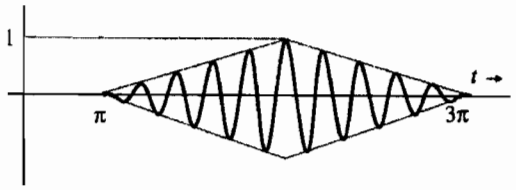
King Fahd University of Petroleum & Minerals
Electrical Engineering Department
EE370: Communications Engineering I (071)
Quiz 2

Serial # 0
-2 points for not writing your serial #

Name: KEY Sec. 4

The signal in the figure is modulated signals with carrier cos 10*t*.



3 a) Express the signal in terms of $g(t)\cos 10t$. What is $g(t)$? ← ③

4 b) Find the Fourier transform of this signal using the appropriate properties of the Fourier transform and the given table.

3 c) Sketch the amplitude and phase spectra.

a) $g(t) = \Delta\left(\frac{t-2\pi}{2\pi}\right) = \Delta\left(\frac{t}{2\pi} - 1\right)$ ← ① ① ①

$g(t)\cos 10t = \Delta\left(\frac{t-2\pi}{2\pi}\right)\cos 10(t-2\pi)$ ← ok

b) ① $\Delta\left(\frac{t}{2\pi}\right) \longleftrightarrow \pi\,\mathrm{sinc}^2\left(\frac{\pi w}{2}\right)$

② $\Delta\left(\frac{t}{2\pi}\right)\cos 10t \longleftrightarrow \frac{\pi}{2}\left\{\mathrm{sinc}^2\left[\frac{\pi(w-10)}{2}\right] + \mathrm{sinc}^2\left[\frac{\pi(w+10)}{2}\right]\right\}$

① $\Delta\left(\frac{t-2\pi}{2\pi}\right)\cos(10(t-2\pi)) \longleftrightarrow$ (same Expression) $e^{-j2\pi w}$

c)

② points