King Saud University
College of Engineering
Electrical Engineering Department

EE320 HW # 3

Q1) Find the inverse Fourier transform of *G(f)* for the spectrum shown in Fig Q1.

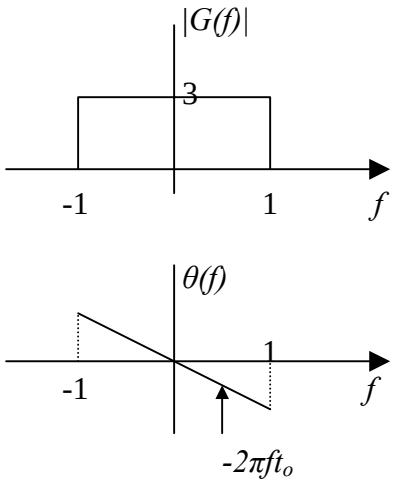

Fig Q1

Q2) If *m(t)* has a Fourier transform as shown in Fig.Q2.

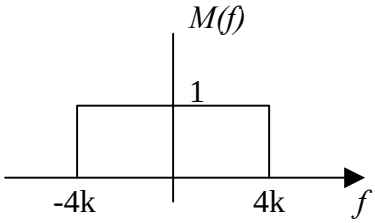

Fig.Q2

Draw the Fourier transform (amplitude and phase) of the following signals:

a) $m_a(t) = m(2t)$ c) $m_c(t) = m(t-1)$ e) $m_e(t) = \hat{m}(t)$

b) $m_b(t) = m(0.5t)$ d) $m_d(t) = \frac{d}{dt}m(t)$

Q3) For the signal

$$g(t) = \frac{2a}{t^2 + a^2}$$

Determine the essential bandwidth B Hz of *g(t)* such that the energy contained in the spectral components of *g(t)* of frequencies below B Hz is 99% of the signal energy.