Solutions to Problem Sheet Five

Problem 1. $s(t) = x_1(t) \cos(10000t) + x_2(t) \cos(20000t)$ **The signal in case (a)** is $y_1(t) = \frac{1}{2}x_1(t)$. **The signal in case (b)** is $y_2(t) = \frac{1}{2}x_2(t)$

This is a simple example of frequency-division multiplexing (FDM)



Figure 1:

Problem 2.

(a) $\frac{2}{\pi}sinc(2t) \iff RECT(\frac{\omega}{4})$ M₁(w) -2 2 W





Figure 5:

(b) Bandwidth $B = \frac{10}{2\pi} = \frac{5}{\pi}$ Hz

(c) Yes







Figure 7: