

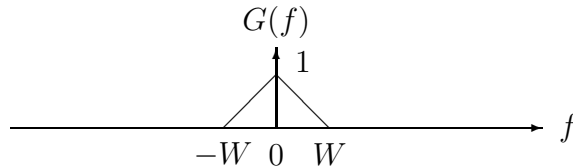
Problems for the 8th Quiz (May 10)

Name: _____ Student ID: _____ Score: _____

1. When performing *sampling* on a signal $g(t)$, we obtain the sampled signal

$$g_\delta(t) = \sum_{n=-\infty}^{\infty} g(nT_s) \cdot \delta(t - nT_s),$$

where T_s is the sampling period. Let the sampling rate be denoted as $f_s = \frac{1}{T_s}$. Draw the spectrum $G_\delta(f)$ of $g_\delta(t)$ over the range of $(-6W, 6W)$ in the following three situations, if $G(f)$ is given by

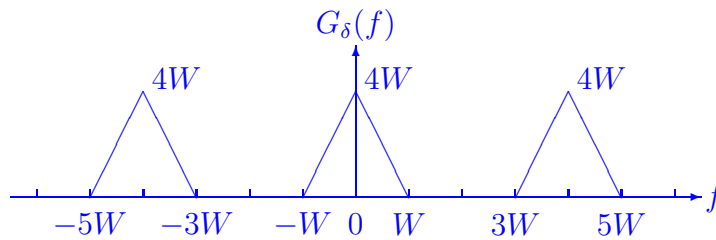


Note: Please remember to mark the “height” of your $G_\delta(f)$. Recall that the larger the f_s , the higher the $G_\delta(f)$.

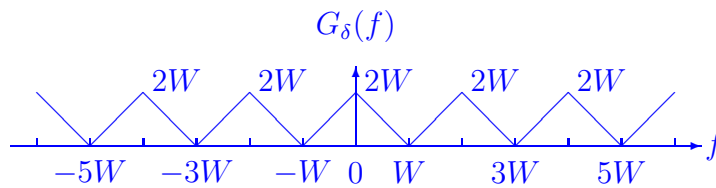
- (a) (25%) $f_s = 4W$
- (b) (25%) $f_s = 2W$
- (c) (25%) $f_s = W$
- (d) (25%) From which situations $G(f)$ can be reconstructed using an ideal lowpass filter?

Solution.

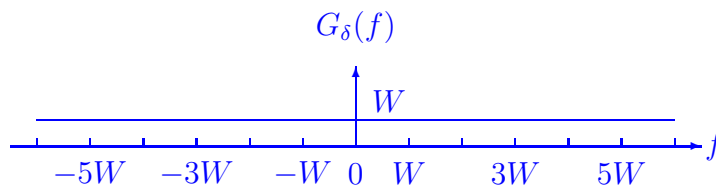
(a)



(b)



(c)



(d) (a) & (b)