

Proposed solutions FWA Jan '06

1. $g(x) = 2H(x) - 1$ in $(-\pi, \pi)$. Multiplication with the sine function is admissible in the framework of tempered distributions.
2. The alias is $\sin(4711 - 1500\pi)x$.
3. Since $\exp |x|^2 = \exp(x_1^2) \exp(x_2^2)$, an iterated integration of the transform integral can be made directly.
4. The filter coefficients are scalar products, which gives finite filter length by a consideration of the relevant integrals. To obtain length $L + 1$, consider the term with the first and the last coefficient, respectively.