Unified Engineering II   **Spring 2004**

Problem S21 (Signals and Systems)

Consider the signal

$$g(t) = (1 + |t|)e^{-|t|}$$

1. Plot the signal. Do you expect the signal to have a "good" duration-bandwidth product, meaning that the product is close to the lower bound?

2. Find the duration of the signal, Δt.

3. Find the bandwidth of the signal, $\Delta \omega$. You may want to use the time domain formula for the bandwidth.

4. How close is the answer to the theoretical lower bound? Explain why the answer is or is not close to the bound.