EE 7725 **Homework 1** **Due: 8 September 1997**

Consider two parallel programs, A and B. Using the notation of the multithreaded model, program A has $P_A = 128$ threads, each of which computes for $t_{m-A} = 22$ before sending a message of size $M_A = 20$ and waiting for a response. The total computation time on 1 processor is $T_A(1) = 25344$. For program B, $P_B = 512$, $t_{m-B} = 20$, $M_B = 53$, and $T_B(1) = 40960$.

Problem 1: Plot the run times of the two programs on a 64-processor machine versus t_{nw}. (That is, t_{nw} is on the x axis and $T(N)$ is the y axis.)

Problem 2: Draw a graph with the number of processors on the x axis and round-trip latency (t_{nw}) on the y axis. Plot a line showing where the two programs have the same run time and label the regions on either side of the line with the faster program. (The graph might be used to find which program to use for a given number of processors and round-trip latency.) Use common sense to determine the range for the axes. (*E.g.*, -2.5 should not appear on either axis.)