SMS-598, Introduction to Acoustical Oceanography. Fall 2005
Assignment #2.

To be typed and handed in (email is OK) for next class (assignment can be done in groups, paper handed individually):

1. Compute the sound speed values for the following S,T, P values (to simplify your life you may want to use the matlab routine sndspd.m from ftp://acoustics.whoi.edu/pub/Matlab/oceans/programs/):

Near surface arctic: 31, 2, 20
Near surface Red Sea: 41, 24, 20
Deep Atlantic Ocean: 36, 2, 5000

2. A normal human can hear sound from 0db to 100db without experiencing too much pain. What are the values in term of pressure units (e.g. Pascal)? How do they compare to the atmospheric pressure on the Earth's surface?

3. A stratified marginal sea has 4 layers with the following sound speed distribution:

	Layer 1	Layer 2	Layer 3	Layer 4
Sound speed	1530	1490	1500	1540
Depth range	0-100	100-400	400-800	800-1200

An explosion has occurred at 100m depth. Plot the ray trajectories starting in the zenith angles: θ=80° 90° and 100° until you get to 40km from the source. Assume the bottom and top boundaries to be reflective. How long did it take each ray to reach a 40km range from the source? At what depth did they arrive there (extra credit: automate the solution by programming it)?