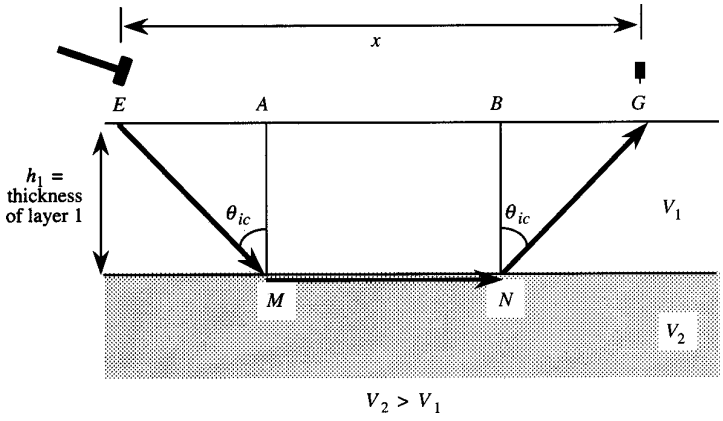
NAME_____

89.456 - APPLIED GEOPHYSICS
CHAPTER 3 PROBLEMS

1. A time-distance plot for a geophone string yields a straight line with a slope of 67 ms/100 m. Calculate the wave velocity.

2. With reference to the following diagram, calculate the total travel time (in ms) for ray path EMNG.



For this problem, x = 500 m, h_1 = 20 m, V_1 = 1000 m s^{-1}, and V_2 =3500 m s^{-1}.

3. Based on refraction data you have identified one subsurface horizontal layer. Given an intercept time of 12 ms, V_1 = 1400 m s^{-1}, and V_2 = 4200 m s^{-1}, calculate the thickness of the material above the discontinuity.

4. Given a horizontal discontinuity, V_1 = 1000 m s^{-1}, V_2 = 3500 m s^{-1}, and crossover distance = 220 m, calculate the thickness of the material above the discontinuity.

5. Given h_1 = 12 m, V_1 = 1200 m s^{-1}, and V_2 = 4200 m s^{-1}, calculate the critical distance.

6. Given three horizontal layers, $V_1 = 400$ m s^{-1}, $V_2 = 1500$ m s^{-1}, $V_3 = 4500$ m s^{-1}, $ti_1 = 10$ ms, and $ti_2 = 20$ ms, calculate the depth to the first and second horizontal discontinuities.

7. Using the data from problem 2, and with reference to the figure used for problem 2, calculate the delay time for geophone G and the depth to the first discontinuity.