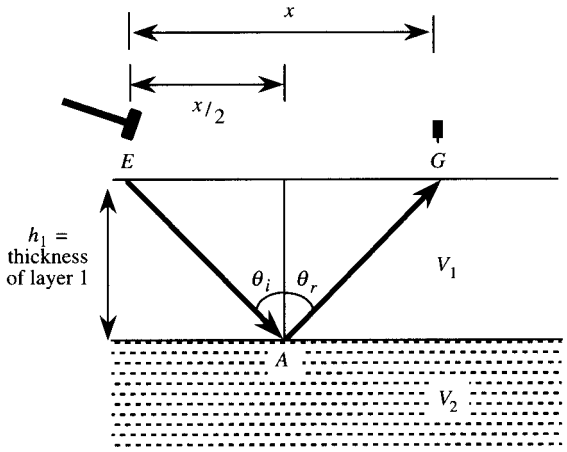
NAME_____

89.456 - APPLIED GEOPHYSICS
CHAPTER 4 PROBLEMS

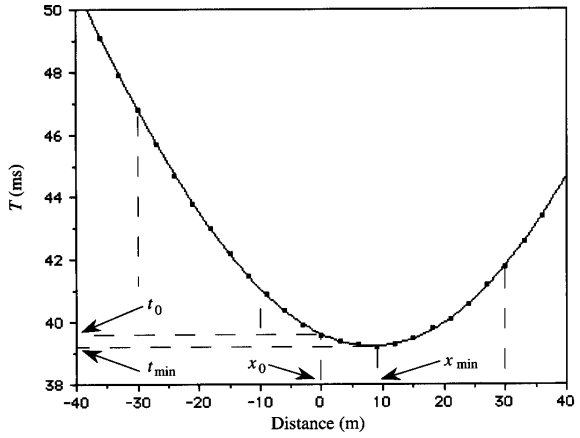
1. With reference to the diagram below, calculate the travel time and normal move-out (NMO) for geophone G given x = 100 m, h_1 = 10 m, and V_1 = 1200 m s^{-1}.



2. For a particular seismic reflection profile an x^2 - t^2 plot gives a slope of 0.2511 and an intercept = 676 ms^2 (t_o^2). Calculate the depth of the reflector.

3. For three horizontal layers, an $x^2 - t^2$ plot yields the following: $V_{rms_3} = 2831$ m s^{-1}, $t_{o_3} = 227.1$ ms and $V_{rms_2} = 2406$ m s^{-1}, $t_{o_2} = 149.3$ ms. Calculate V_3 and h_3.

4. From the diagram below we determine that $x_{min} = 9$ m, $t_{min} = 39.1$ ms, and $t_o = 39.7$ ms. Given that $V_1 = 1150$ m s^{-1}, calculate values for β, j, and h.



5. For a dipping interface we determine the following values from an $x^2 - t^2$ plot: V = 1650 m s^{-1} and t_o = 37.5 ms (Figure 4-21 illustrates the approach). A particular geophone is 30 m from the shot point and the travel time to this geophone is 40.5 ms. Calculate the values for j, β, and h.

6. From the diagram below, t_{+x} = 39.14 ms, t_{-x} = 36.74 ms, +x = 30 m, and x_{min} = 6.08 m. We have independently determined V = 2000 m s^{-1}. Calculate β, j, and h.