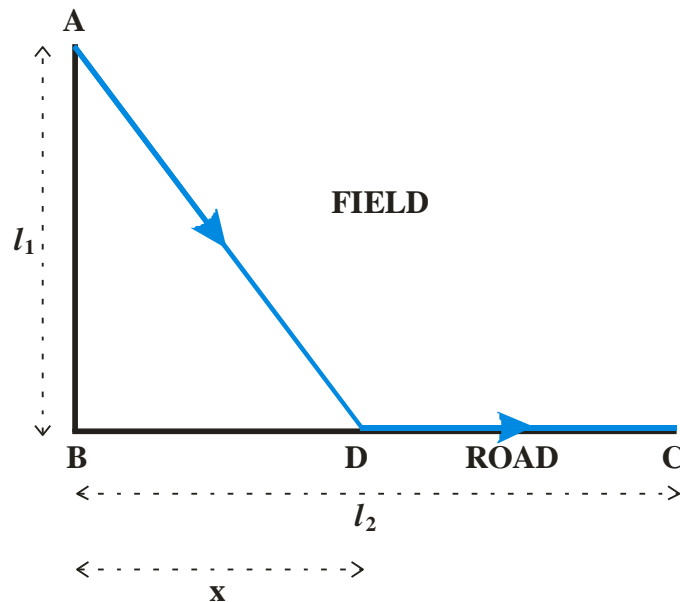


**Problem 3**

A man stands at a point  $A$  in a field, at a distance  $l_1 = 600\text{ m}$  from the road  $BC$ . In the field his velocity is  $v_1 = 1\text{ m/s}$ , while on the road  $BC$  it is  $v_2 = 2\text{ m/s}$ . He can walk in the field along  $AD$  and on the road along  $DC$  in order to reach the final destination  $C$ . The distance between  $B$  and  $C$  is  $l_2 = 800\text{ m}$ . Your final assignment is to find his route, so that he can reach the destination in the least possible time and to determine the time elapsed. In order to do this, you need to find the coordinate of the point  $D$ , i.e., the distance  $x = BD$ . We will lead you through several steps in order to fulfill this assignment.



- Find the expression for the time  $t_1$  for the motion on the field (route  $AD$ ) as a function of  $x$ . [2 points]
- Find the expression for the time  $t_2$  for the motion on the road (route  $DC$ ) as a function of  $x$ . [2 points]
- Find the expression for the total time  $t$  as a function of  $x$ . [2 points]