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The driver of an automobile suddenly sees an obstacle blocking his lane. Determine the total distance the car travels between seeing the obstacle and stopping (d) as a function of his reaction time (t_{12}), the initial velocity of the car (v_1), and the magnitude of the car's acceleration while stopping (a).

Motion Information

Event 1: Event 2: Event 3:

$t_1 =$ $t_2 =$ $t_3 =$

$r_1 =$ $r_2 =$ $r_3 =$

$v_1 =$ $v_2 =$ $v_3 =$

$a_{12} =$ $a_{23} =$

Mathematical Analysis

Questions

If $v_1 = 0$ m/s, what should d equal? Does your function agree with this observation?

If $a = 0$ m/s², what should d equal? Does your function agree with this observation?

Does the car travel a greater distance during the reaction phase or the braking phase? Estimate necessary quantities assuming a panic stop from highway speeds.

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