

I-54

Two automobiles are involved in a race over level ground. Both cars begin at rest. The Audi accelerates at A for T seconds and then travels at constant velocity for the rest of the race. The Buick accelerates at $A/2$ for $2T$ seconds and then travels at constant velocity for the rest of the race. Determine the distance (d) between the two cars, at the instant $t = 2T$, as a function of A and T .

Motion Information

Object:			Object:		
Event 1:	Event 2:	Event 3:	Event 1:	Event 2:	Event 3:
$t_1 =$	$t_2 =$	$t_3 =$	$t_1 =$	$t_2 =$	$t_3 =$
$r_1 =$	$r_2 =$	$r_3 =$	$r_1 =$	$r_2 =$	$r_3 =$
$v_1 =$	$v_2 =$	$v_3 =$	$v_1 =$	$v_2 =$	$v_3 =$
$a_{12} =$	$a_{23} =$		$a_{12} =$	$a_{23} =$	

Mathematical Analysis

Questions

If $A = 0 \text{ m/s}^2$, what should d equal? Does your function agree with this observation?

Assume the race takes longer than $2T$ to finish. What is the difference in speed between the two cars as they cross the finish line?

Assume the race takes longer than $2T$ to finish. What is the distance between the two cars as they cross the finish line?