

The original problem is below. We know that distance = rate x time. ($d = r t$) Since the track is 1 mile and the rate is 30 mph on the first lap, $1 = 30 t$ so $t = 1/30$. In other words it takes the car $1/30$ of an hour (2 minutes) to complete the first lap. We want the average speed for 2 laps to be 50 mph. Thus $2 = 50 t$. Solving for t yields $t = 2/50$ hours (2.4 minutes), which is the amount of time for both laps together. So the amount of time available for the 2nd lap is $2/50 - 1/30 = 1/150$ hours (.4 minutes). We now know the time and distance for the second lap so plugging in we can solve for the rate: $1 = r (1/150)$ thus $r = 150$ mph

Time Trials

A car travels one lap around a 1 mile track at an average speed of 30 miles per hour. At what average speed must the car travel on the second lap so that the average speed for both laps is 50 miles per hour.