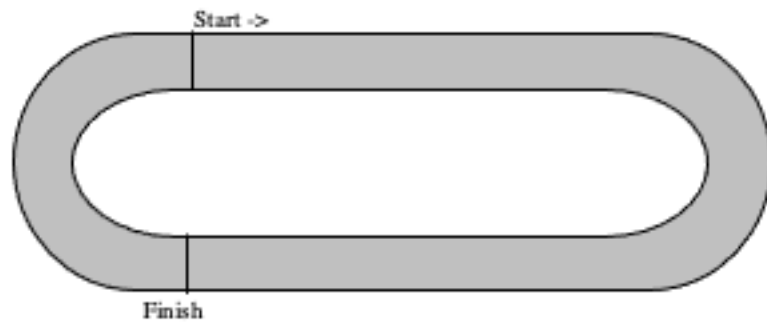


First Rate

Level D

You are an Olympic-hopeful runner. You have just qualified to be in the finals of a 1,500-meter race. The track is 400 meters in an oval shape. The race is three and three-fourths laps around the track.



The favorite to win the race is Jaali, who holds the current best time, which is 3 minutes 29.4 seconds. Jaali runs a very steady race. Each of Jaali's lap times (400 meters) is within a second of one another.

You run a completely different type of race. You have a very strong kick, which means you usually lag behind for the first three laps to save energy, and when the leader has 300 meters to go, you push yourself to win at the finish line. You like to save energy in the first three laps, but you don't want to be more than 50 meters behind when you start your kick to the finish line.

Determine your strategy to win this race.

What is the average speed you need to run in the first part of the race? What is the average speed you need to run during your kick to win the race? How might your race change if Jaali runs two seconds faster?

