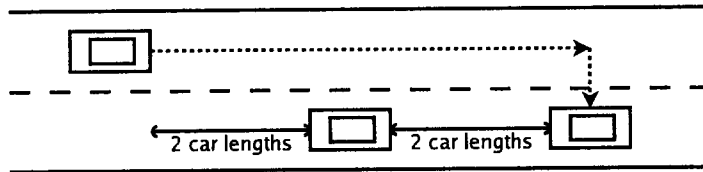


QP42

Road Rage



Traveling on a two-lane country road, you are behind a slowpoke going 40 miles per hour in a 45 mile-per-hour zone. The road straightens out and you decide to pass the car. You pull into the other lane exactly 2 car lengths behind the other car, traveling at the same speed. Pressing the gas pedal to the floor, you accelerate at 2 miles per hour per second. You ignore the speed limit and merge into your original lane exactly 2 car lengths ahead of the slowpoke without slowing down. Both of your cars are 15 feet long.

- (a) [2 points] How much distance have you traveled by the time you have passed the other car and returned to the original lane?
- (b) [2 points] How fast are you going at this point?
- (c) [2 points] What is the minimum distance a car traveling at the speed limit in the other direction should be from you when you begin passing in order to pass the slowpoke as described above and avoid a collision? Assume you can change lanes instantaneously.