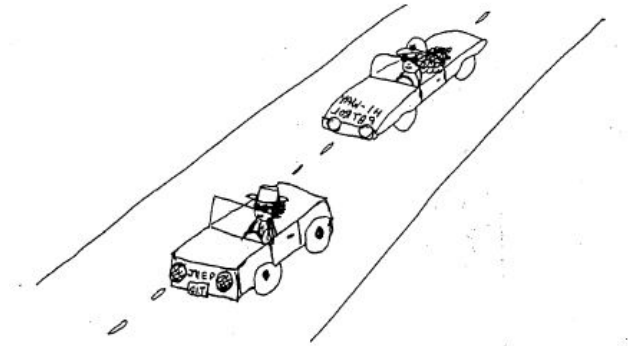**QP17**

Indiana Jones, on his way home to Caltech after an adventure in the Mojave desert, is doing 80 mph on the 210 Freeway. A California Highway Patrol Officer is parked in her Porsche at a turnout. She starts accelerating at 8 mph/sec as Indiana passes her (1 mile = 1760 yards).

a) (2 points) When will the officer catch up to Indiana?

b) (1 point) How fast would the officer be going when she catches up to Indiana?

c) (1 point) Sketch graphs of $(x)t$ and $v(t)$, labelling both Indiana and the officer.

   Actually, when the officer is 100 yards behind Indiana, Indiana slams on his brakes. Assume at this position, the officer's speed is that obtained in part (b). The officer brakes immediately as soon as she sees Indiana's brake lights (zero reaction time). Both cars brake with the same deceleration, d.

d) (2 points) What time after the brakes are applied do they collide?

e) (1 point) What is their relative speed at the time of the collision?