## Math 120E (QUIZ 1, October 2, 1997)

Instructions: You have 25 minutes for this quiz. **Show your work; NO CREDIT for answers only.** Note that the quiz is on **both sides** of the paper.

Two planes flying at the same altitude pass each other in air. The first plane, a 737, is at the point labelled A exactly when the second plane. a DC-10, is at the point labelled B. They are flying at constant speeds in opposite directions, and the distance between points A and B is 100 miles.
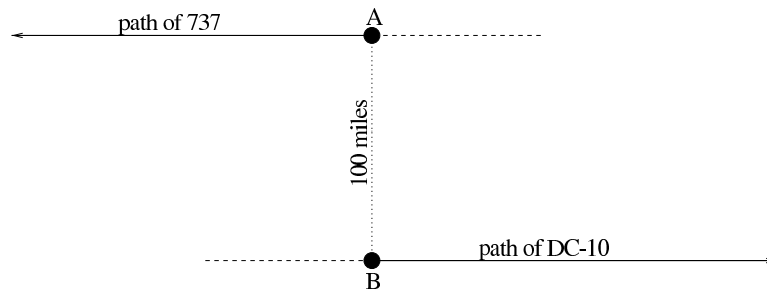
Recall 1 mile = 5280 feet.
Throughout this problem, let $t = 0$ be the instant the 737 passes through point A and the DC-10 passes through point B.

1. (2 points) Impose a coordinate system and draw it into the picture above. Clearly label the axes and label points A and B with their coordinates. Let miles be the unit of distance.

2. (3 points) Suppose the 737 is travelling in the direction shown at 264 ft/s. How far, in miles, does the 737 fly in the time from $t = 0$ to $t = 25$ minutes?

3. (3 points) What are the coordinates of the 737 at time t **hours** after it passes through point A? Use the coordinate system you chose above and recall that the distance unit is miles.

4. (2 points) Suppose the distance in miles between the two planes is given by the formula

$$d = \sqrt{100^2 + (300t)^2}$$

where t is the time in hours. What is the speed of the DC-10, in miles per hour?