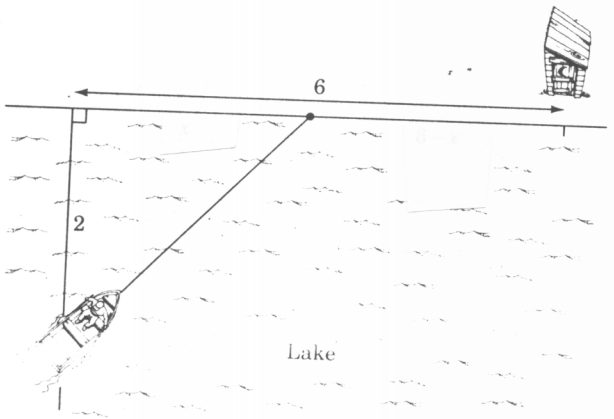
Problem *Find two nonnegative real numbers that add up to 66 and such that their product is as large as possible.*

Problem *You are in a rowboat on Lake Erie, 2 miles from a straight shoreline, taking your potential in-laws for a boat ride. Six miles down the shoreline from the nearest point on shore is an outhouse. You suddenly feel the need for its use. It is September, so the water is too cold to go in, and besides, your in-laws are already pretty unimpressed with your "yacht." It wouldn't help matters to jump over the side and relieve your distended bladder. Also, the shoreline is populated with lots of houses, all owned by people who know your parents, and would love to get you in trouble with them. If you can row at 2 mph and run at 6 mph (you can run faster when you don't have to keep your knees together), for what point along the shoreline should you aim in order to minimize the amount of time it will take you to get to the outhouse?*



Problem *Northern Kansas University is building a new running track. It is to be the perimeter of a region obtained by putting two semicircles on the ends of a rectangle as in Figure 16.2. However, due to financial constraints, the administration has decided to grow corn in the area surrounded by the track. If the track is to be 440 yards long, determine the necessary dimensions to build the track in order to maximize the area for growing corn.*

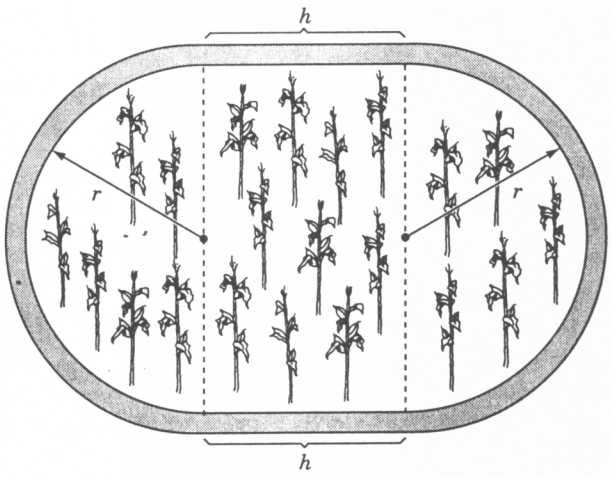


Figure 16.2 Running around the cornfield.