Help a robot to navigate

After a robot has traveled a lot, it now wants to go home. It has no map and cannot ask anybody for directions. But, fortunately it has a device that tells the robot the current distance in meters to its home.

If the robot is at position (x,y) the device returns the distance using the following formula

$$dist(x,y) = \sqrt{((x-x_H)^2 + (y-y_H)^2)}$$

Use gradient descent to help the robot to come home. The robot starts at position (10,2), the home is at position (x_H=5, y_H=5), the step size is 1, Δx=0.1. How many steps are required until the robot is at home (closer than 1 meter). Hint: at each iteration, update the x and the y position as well.

Search space

Use brute force to compute and visualize the search space (from 0 to 15m in x and y at a distance of 0.1m) for the above scenario.