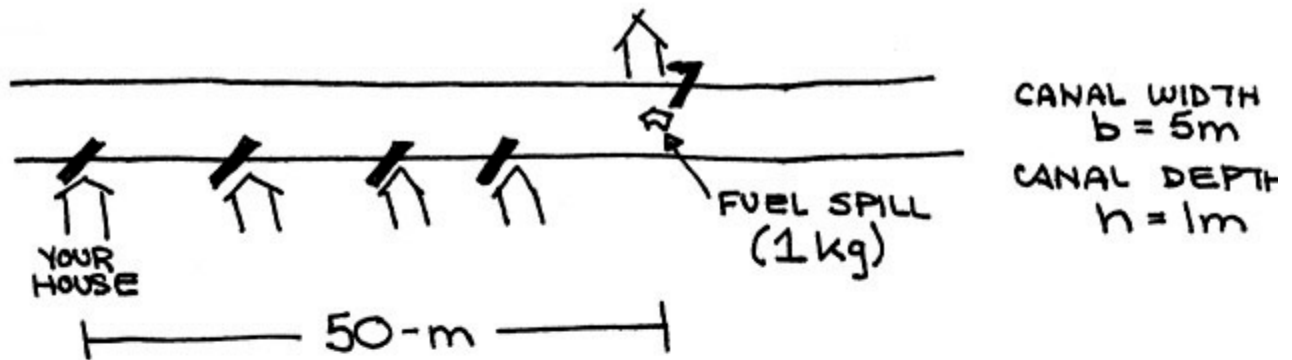


Problem 1.5



YOU OWN A HOUSE AND DOCK ALONG A LONG BOAT CANAL. ONE DAY YOUR NEIGHBOR HAS A SMALL FUEL SPILL. DUE TO THE BOAT TRAFFIC, THE DIFFUSIVITY IN THE CANAL IS QUITE HIGH, $D = 0.01$. THE CURRENT IN THE CANAL IS NEGLIGIBLE, SUCH THAT THE FUEL IS TRANSPORTED TO YOUR HOUSE BY DIFFUSION ONLY. ASSUME THE FUEL MIXES RAPID ACROSS THE WIDTH AND DEPTH.

- HOW LONG DOES IT TAKE FOR THE SPILLED FUEL TO REACH YOUR HOUSE?
- FOR THE TIME FOUND IN A), WHAT IS THE CONCENTRATION AT YOUR HOUSE?
- WHAT IS THE MAXIMUM CONCENTRATION AT YOUR HOUSE?