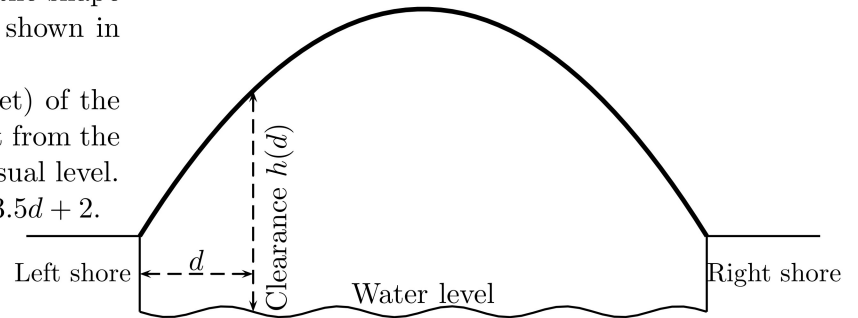


## 5. [16 points]

A bridge over the Huron River has the shape of a (symmetric) parabolic arch, as shown in the figure on the right.

Let  $h(d)$  denote the clearance (in feet) of the bridge over a point in the river  $d$  feet from the left shore when the water is at its usual level.

We are told that  $h(d) = -0.07d^2 + 3.5d + 2$ .



- a. [8 points] By completing the square, find the maximum clearance of the bridge (that is, the clearance of the bridge at its highest point). *Remember to include units.*

- b. [3 points] At the bridge crossing, what is the width of the river (distance from left shore to right shore)? *Remember to include units.*

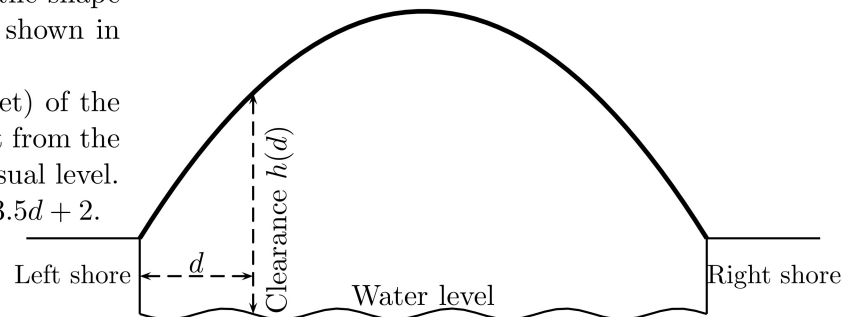
*This problem continues on the next page.*

This is a continuation of the problem from the previous page. For your convenience, the original problem statement has been reprinted here.

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- c. [5 points] Murphy is rafting down the Huron river. As Murphy's raft is passing under the bridge, he decides to pull his raft over to the left shore of the river. Murphy is six feet tall. How close to the shore can he get before he hits his head on the bridge? (Assume that Murphy is standing upright, and that the height of the raft is negligible.)

Find an answer in *exact form* and then give an approximate value accurate to at least 2 decimal places.