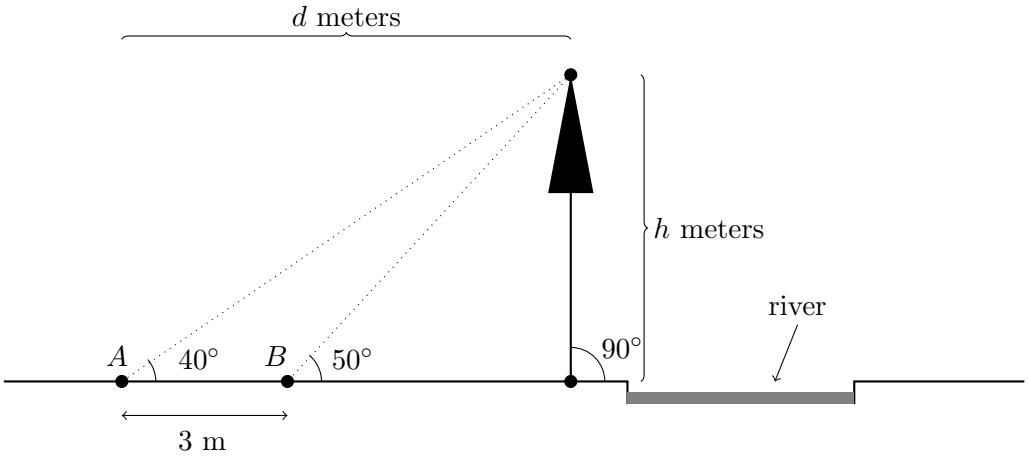
8. [8 points] Chuck had a strange yet familiar dream on the night he got back to the farm. His path was blocked by a fast-flowing river. Spying a small tree beside the river, Chuck thought about cutting down the tree to make a log bridge. He knows the points A and B are three meters apart, and he knows the angle between the ground and the line from the points A and B to the top of the tree. The tree is h meters tall and makes a right angle with the ground. The figure below depicts the situation.



Please leave your answers in exact form.

a. [4 points] Write expressions for $\tan(40°)$ and $\tan(50°)$ in terms of d and h.

$\tan(40°) =$ _____

$\tan(50°) =$ _____

b. [4 points] Solve the system of equations you got in part (a) to find h in terms of $\tan(40°)$ and $\tan(50°)$ (and not in terms of d).

$h =$ _____