

Hint on geometry of Problem 2

There are different ways to determine the furthest extent of the shadow! We discuss one method below:

- The straight line through points L and U determines the extent of the shadow.
- You can calculate the slope of that line using points L and U.
- Given the constraints on the location of the light source, that line must intersect the line $x=10$ (the right wall). You can calculate the y-coordinate of the intersection point using the slope, either point L or point U, and the x-coordinate 10.
- If the y-coordinate of the intersection point is above $y=0$, the bottom wall, then that is the furthest extent of the shadow.
- If the y-coordinate of the intersection point is below $y=0$, then the furthest extent of the shadow is on the bottom wall, and you can solve for the x-coordinate in the same way as discussed above.