1. [5 points] I showed you how to create a point light source shader. What would you need to do to the code to make it a spot light? Provide the relevant code snippet.

2. [5 points] For specular lighting, we introduced the halfway vector, using the angle between that and the normal ($\phi$) instead of the angle between $v$ and $r (\theta)$. Show that when all of the vectors are coplanar, $\theta = 2\phi$, but in general this is not true.

3. [15 points] Given the following height field, what is the normal vector for the center point? (assume the surface is to be tessellated into triangles as shown)