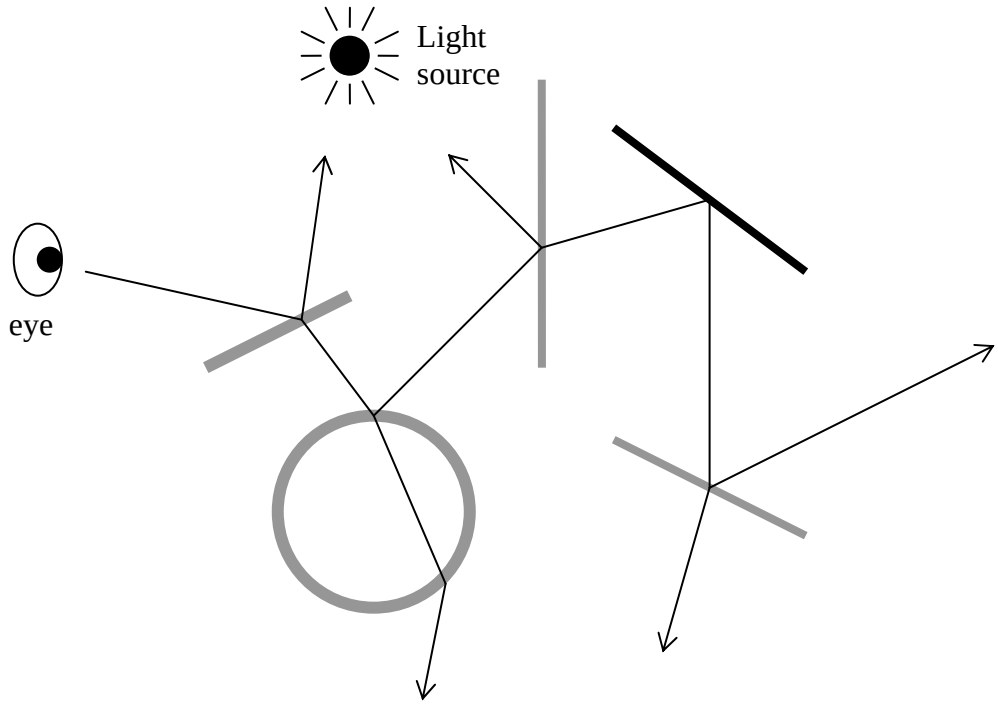
Please attempt all the 3 questions before attending tutorial.

1. There are three spheres in the space with centers (0,0,10), (0,3,8) and (0,1,9). They all have the same radius of 2 units. A ray starts tracing from the eye which is at the origin, (0,0,0) with direction (0,0,1). Which is the first sphere that is hit by the ray?

2. Draw the ray tree according to the following ray in the scene. There are altogether five positions on the objects which require the computation of light intensity. State which of these points need to include all three terms of the Phone illumination model since some of them only need to include the ambient term only. Assume there is no internal reflection in the sphere.



3. Given three vertices ***a***, ***b***, and ***c*** in the space, they form a triangle *abc*. A light ray, ***l****(t)*, shooting from a point ***p*** with direction ***v*** can be represented by the line ***l****(t)* = ***p*** + *t* ***v*** in which *t* is a real number. How to determine if the light ray ***l****(t)* hits the triangle *abc*?