Selected Problem Set 8

1. Given the ray \( \vec{r}(t) = \vec{e} + \vec{d} t \) where \( \vec{e} = (3,3,3) \) and \( \vec{d} = (-1,-1,-1) \), find the minimal value of \( t \) for which the ray intersects a generic sphere.

2. Give the 3D coordinates of the intersection point on the sphere.

3. Give the sphere surface normal at the intersection point.

4. Given a light located at \( (0,0,10) \), give the unit vector from the intersection point to the light source.

5. Compute \( \vec{r} \), the vector of specular reflection at the intersection point.