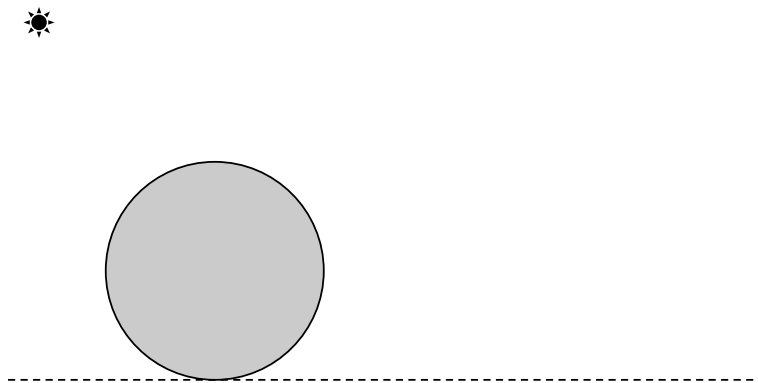


Final quiz practice questions

1. **3D coordinate systems:** Imagine a cylinder centered at the origin, with the circular faces lying on the planes $y = -2$ and $y = 2$. Draw the *back view* of an orthographic projection of this cylinder, labeling the positive and negative axis. Then do the same for the *top view*.

2. **Lighting:** This diagram shows the side view of a light source and a sphere, both in the same vertical plane. Denote the portion of the dotted line (floor) that will be in shadow due to the sphere.



3. **Ray-tracing:** You are given a ray with direction $(\frac{\sqrt{2}}{2}, 0, -\frac{\sqrt{2}}{2})$, pointing towards a pixel with coordinates $(1, 3, -1)$. What is the location of the camera if it is 6 units away from this pixel?

4. **Perspective projection:** Given the following 8 vertices of a cube in world space, find the corresponding coordinates of each in viewport/screen space, using a perspective projection with the viewport at $z = -1$. Then draw what the “viewer” would see.

world coordinates	screen coordinates
$(-2, 1, -1)$	
$(-1, 1, -1)$	
$(-1, 2, -1)$	
$(-2, 2, -1)$	
$(-2, 1, -2)$	
$(-1, 1, -2)$	
$(-1, 2, -2)$	
$(-2, 2, -2)$	