Name: ———————————————————   **Student ID:** ———————————————————

1) Describe how to test if a ray with origin $\vec{x}_0$ and direction $\vec{d}$ intersects an infinite cylinder centred on the y-axis with radius 1.

2) Which is faster, and why: raytracing or rasterizing a single triangle?

3) Explain a problem that can happen with shading a triangle mesh if smoothly interpolated normal vectors are used.

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4) What is an effect that pathtracing approximates which regular raytracing (like assignment 3) cannot?

5) Describe how to incorporate shadows into a matte shader using ray tracing.

6) Why is clipping of some sort necessary for the Z-buffer algorithm when used with perspective projection via 4×4 matrices and homogeneous coordinates?

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7) Describe how to test if two points, $\vec{p}$ and $\vec{q}$, are on the same or different sides of the plane containing a triangle with vertices $\vec{x}_0$, $\vec{x}_1$, and $\vec{x}_2$.

8) Given n points stored in a BVH of spheres, develop an efficient algorithm for finding the closest point to the origin.