Honors Geometry Cylinders - 1 Name:

**Answer the questions below as completely as possible. Use complete sentences and add sketches as needed. Work with a model before you try to answer the questions.**

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1. A bug is walking on a soda can. (Assume the can extends indefinitely – there is no top or bottom).

a) From an *extrinsic* perspective, describe the three distinct paths traced by the bug if she walks due north, east, or northeast. How do the shapes of the paths differ?

b) Discuss the three paths from an *intrinsic* perspective, that is, from the bug’s perspective.

c) Try to think of any experiments the bug might perform to determine in which direction she is walking. (The bug has no compass, and cannot leave the surface of the can.)

2. Can a line on a cylinder intersect itself?

3. Can two different lines intersect more than once?

4. (Line Postulate) Do two points determine exactly one line?

5. Can you make a sketch or find an example that contradicts your answer to # 4?

6. (Parallel Postulate) Are there parallel lines on a cylinder? Given any line and a point not on the line, does there always exist exactly one parallel line through that point?