Honors Geometry Cones 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.**



1. A bug is walking on an ice cream cone. (Assume the cone extends forever).

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? **(I highly recommend you use a paper model for this. Draw the lines first).**

b) Discuss the three paths from an *intrinsic* perspective, that is, from the bug’s perspective. Are there any differences?

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 cone.)

2. Can a line on a cone intersect itself? *(Consider two case for this: one with a “cutout” greater than 180°, and one where it is less).*



3. Can two different lines intersect more than once?

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

5. Are there parallel (non-intersecting) lines on a cone? Experiment with a piece of notebook paper. Consider two cases as in # 3.



