Honors Geometry Cylinders - 2 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. Given two points A and B on a cylinder as shown, discuss the following statement: *A line segment is the shortest distance between two points*.

2. Are all lines on a cylinder infinitely long (assuming the cylinder extends “up” and “down” forever)? Discuss the following statement:

*A line may be extended indefinitely.*

3. Determine whether each of the statements below is true or false.

a) Perpendicular lines exist.

b) All right angles are congruent.

c) All vertical angles are congruent.

d) Given a line and a point not on that line, there exists exactly one perpendicular line through that point.

e) Supplements of congruent angles are congruent.

4. Do transformational isometries exist on a cylinder?

a) reflections? (And do they still reverse orientation?)

b) rotations?

c) translations?

d) Can all cylindrical lines be translated along themselves?

e) Some cylindrical lines can be rotated along themselves. Which? Where is the center of rotation?

5. Given two points A and B as shown, how many points are midway between A and B? Use a model! The answer is counter-intuitive.

6. Imagine a coordinate grid on a cylindrical surface.

a) Would every point have a unique representation?

b) Consider a line of the form *y = mx + b.* How many *y*- intercepts would this line have? How many *x*-intercepts?