## Extra Credit #2 (10pts total)

1. Consider a geometry in which Euclid's 5th postulate is replaced by:
   Through any point NO line can be drawn parallel to a given line.

   Show that there is at least one triangle in this geometry whose angles sum to more than two right angles.
   (*Hint*: On a line PQ select two points A and B. Construct lines AC and BD perpendicular to PQ. What happens in this geometry if AC and BD are extended in both directions?)
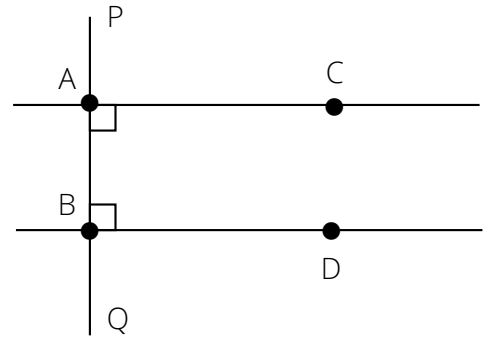
2. The geometry of #1 above is, suitably treated, the geometry of the surface of a sphere. The Earth is, to good approximation, a sphere of circumference 40,000 km.

   (a) On this sphere, what is the sum of the angles of a triangle all of whose sides are 10,000 km? (An example of such a triangle is shown as triangle ABC. It has one vertex at the North Pole and extends down to the equator.)

   (b) What is the circumference of a circle of radius 10,000 km in this surface?

   (c) The triangle ABC is a right triangle all of whose sides are 10,000 km long. What is its area? (Reminder: The area of the Earth is 509,300,000 km².)