1. Can you find a triangle on the sphere where the interior angles add to more than π radians?

2. What is the biggest interior angle sum you can find for a triangle?

3. A **biangle** or **lune** on a sphere is a region enclosed by two distinct great circles. Let $A(\theta)$ denote the area of a lune with interior angle θ. Find a formula for $A(\theta)$ in terms of θ and the area S of the sphere.

4. Form a triangle on your copy of a sphere using great circles for sides. How many copies of that triangle appear on the sphere?

5. Use your diagram from the previous question to determine the number of lunes that overlap your triangle.

6. Find a formula relating the area of the sphere, the area of your triangle, and the area of the lunes on your sphere.

7. Find a formula relating the area of a triangle on a sphere and its angle surplus (i.e. $\theta_1+\theta_2+\theta_3-\pi$).

8. What does your formula say about the existence of similar triangles on the sphere?