Due March 25 to be turned in:

1. **Final Draft of Assignment 6:** Area of a triangle on a sphere
2. **Reflection:** In what ways does what we have studied thus far in Math 5341 have value and usefulness to you as a teacher (or potential teacher) of mathematics?

Today we will find the formula for the area of a triangle on a hyperbolic plane of radius ρ. (See pp 91-95 in text. Problem 7.2.)

a. Show that all 2/3-ideal triangles with the same angle θ are congruent.
b. Show that the area function A for a 2/3-ideal triangle is additive, i.e. $A(\alpha + \beta) = A(\alpha) + A(\beta)$, where α, β are exterior angles.
c. We will use the fact that a *continuous* additive function must have the form $A(\alpha)=\text{constant} \cdot \alpha$.
d. Now let the finite vertex of a 2/3-ideal triangle go to infinity. The interior angle will go to zero and the exterior angle will go to π. So $A(\pi)$ is the area of an ideal triangle.
e. So we now know that all ideal triangles on the same hyperbolic plane have the same area. We will call it I.
f. Put e. together with c. to get that $A(\alpha)=(I/\pi) \cdot \alpha$.
g. (From chapter 17, we will use the fact that $I= \pi\rho^2$.)
h. Now look at figure 7.3 on page 92, and put the pieces together to figure out a formula for the area of a hyperbolic triangle. Note that the interior angles of the triangle are the exterior angles of the 2/3-ideal triangles.

What does this say about the sum of the interior angles of a hyperbolic triangle?