A. AIAT and converse
B. $\measuredangle$ sums.
C. From Δs to polygons

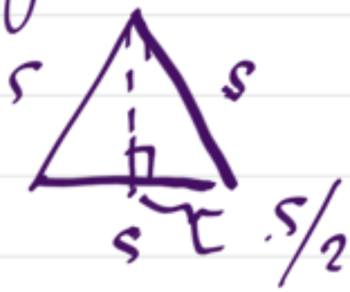
Mon 8/28 : I. Questions on HW

II. Show coral picture as an example of hyperbolic geometry in nature.

III. Intro to TeX.

Wed, 8/30 : I. Tiling the plane
A. what shapes are possible & why?
B. How does perimeter of a cell translate into total perimeter?
Sol. Let N = # of cells. The $P_T \approx N \cdot \frac{P}{2}$. That is, give P_T, what shape will yield the largest area? Of course, $A_T = NA$, so we simply want find largest ratio A/p.

II. Let's work out this ratio for an equilateral Δ:



$$h=\sqrt{s^2-\left(\frac{s}{2}\right)^2}=\sqrt{\frac{3}{4}s^2}=\frac{s\sqrt{3}}{2}.$$

So $A=\frac{1}{2}sh=\frac{1}{2}s\left(\frac{s\sqrt{3}}{2}\right)=\frac{s^2\sqrt{3}}{4}$.

$P=3s$, so $A/P=\dfrac{s^2\sqrt{3}/4}{3s}=s\dfrac{\sqrt{3}}{12}$.

Hmm! Better to use $s=\frac{P}{3}$; hence $A/P=P\dfrac{\sqrt{3}}{36}$.

Although the ratio does depend on P — is there a general principle here? Why are animals that live in colder places larger? — This won't matter, because P will be held constant.

(So what determines P for the bees? Probably, the size of the cells.)

We have what we need, but for additional content and practice:

$A = \frac{P^2\sqrt{3}}{36}$, so $P = \ldots$

III. The square is easy. What about the hexagon? Don't just look up a formula!! Work it out for yourselves. What are some ways you could do that?

Fri 9/1 I. Hand out Ch. 2.

II. A. How did students learn about area? Develop basic properties of invariance + additivity. Can proceed from unit or from continuous definition.

B. Develop area of other figures; Have students explain the formulas!!

III. Presentation on area of circle + Pyth. Thm.