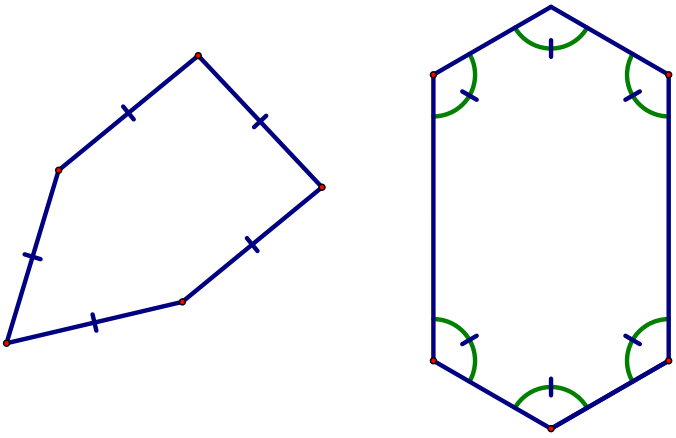
Regular Polygons - Lesson 7-4

Here's today's warmup…you can do it!!

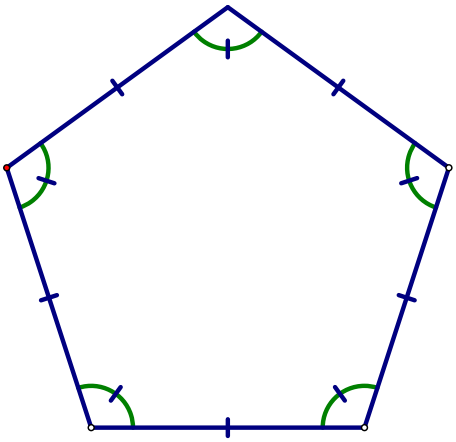
How many sides does a polygon have if each of its interior angles has a measure of 160°?

OK…today's lesson is very short…we'll start by defining what equilateral, equiangular, and regular polygons are:



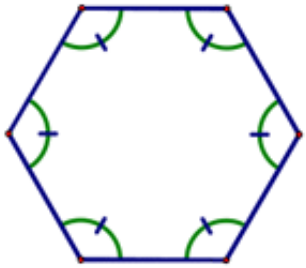
A polygon is an *equilateral polygon* if and only if its sides are equal in measure.

A polygon is an *equiangular polygon* if and only if its angles are equal in measure.



If a polygon is both equilateral and equiangular, then it is said to be a *regular polygon*.

Now let's look at how to calculate the measure of one angle in an equiangular polygon. Note that this only works for *equiangular* (and therefore *regular*) polygons. Don't try to use this for a polygon that is not equiangular!!



Number of sides of *EQUIANGULAR POLYGON* (n) = 6.

Measure of all interior angles [(n-2)180°] = (6-21)80° = 720°.

Measure of one interior angle $\left(\frac{\text{sum of int. angles}}{n}\right) = \frac{720°}{6} = 120°.$

Theorem 57: **the measure E of each exterior angle of an equiangular polygon of n sides is given by the formula** $E = \frac{360}{n}$.