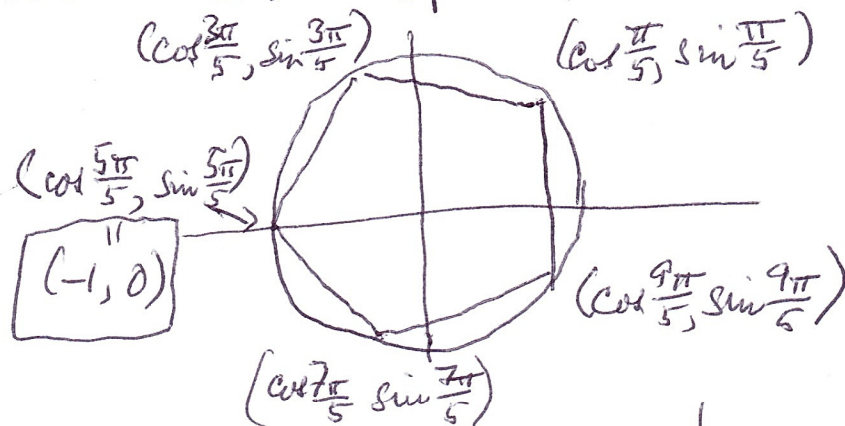


# Convexity of regular polygons

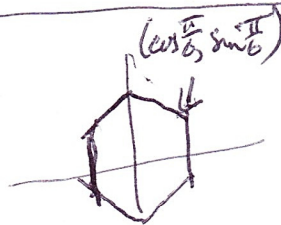
First step (not profound, but messy to prove)

Every <sup>reg.</sup> polygon with  $n$  sides is  $\cong$  a standard model. Example for pentagon (radius = 1)



Now  $\cos \frac{\pi}{5} = \cos \frac{9\pi}{5}$

It looks like the three vertices on the left all lie on the same side of the line  $x = \cos \frac{\pi}{5}$ . One can check this using properties of the cosine function. Now rotations through angles  $\frac{2k\pi}{5}$  (counter clockwise) yield self congruences of this pentagon, and one can use this to say that if we are given two consecutive vertices, the others lie on the same side of the line determined by these vertices.



Hexagon picture