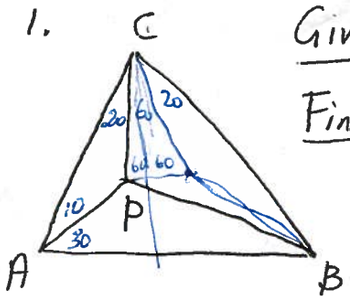
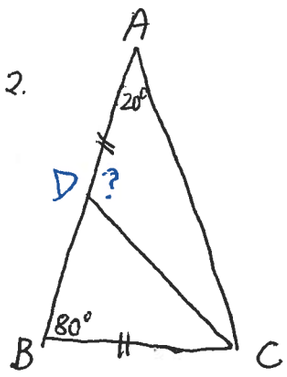
2005 Winter Camp

1. 

Given: $\angle PAC = 10^\circ$ $\angle PCA = 20^\circ$ $\angle PAB = 30^\circ$ $\angle ABC = 40^\circ$.

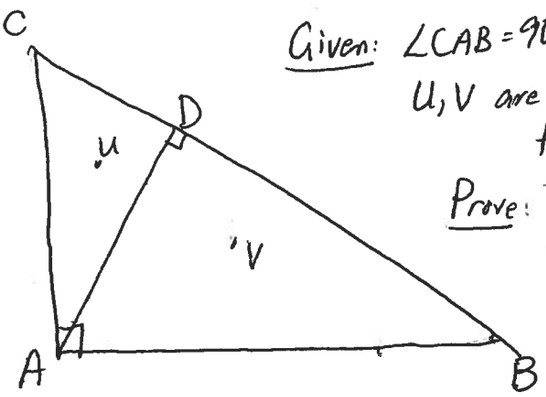
Find: $\angle BPC$

2. 

Given: $\angle BAC = 20^\circ$ $\angle ABC = 80^\circ$ $AD = BC$

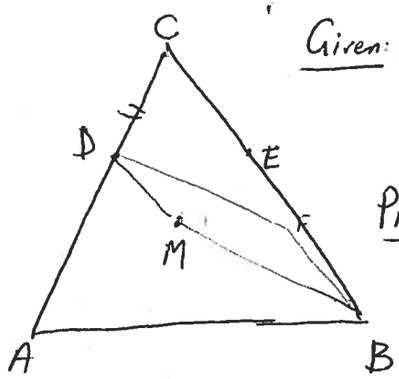
Find: $\angle ADC$

3. (CMO 1991) Let C be a circle, P a given point in the plane
Each line through P which intersects C determines a chord of C.
What is the locus of the midpoints of these chords?

4. 

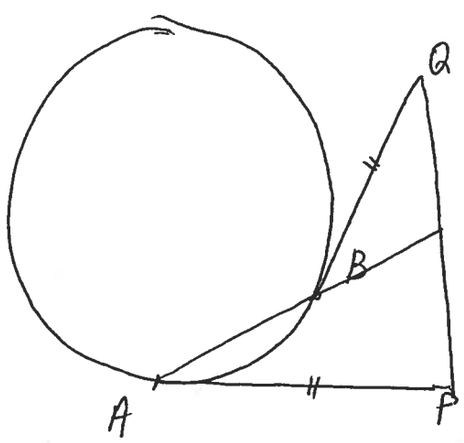
Given: $\angle CAB = 90^\circ$, $AD \perp BC$
U, V are the centres of the respective incircles of triangles ACD, ABP.

Prove: The angle bisector of $\angle A$ is perpendicular to UV.

5. 

Given: $\triangle ABC$ is equilateral with centroid M
$CD = CE$
DMBF is a parallelogram

Prove: $\triangle MEF$ is equilateral.

6. 

At points A and B on a circle, equal tangents AP and BQ are drawn as indicated.

Prove that AB produced bisects PQ.