GEOMETRY
DR. PAUL L. BAILEY

Homework 0120
Wednesday, January 20, 2021

This homework is due Friday, January 22, 2021. Write *neatly.* Put effort into your work.

Problem 1. Given circle $\odot P$ and point D outside of it, let A and B be on the circle such that $\overleftrightarrow{AD}$ and $\overleftrightarrow{BD}$ are tangent to the circle. The line $\overleftrightarrow{DP}$ intersects the circle in two points, X and Y, with $DY < DX$. Suppose $m\angle ADB = 42°$. Draw this, then compute $m\angle AXB$ and $m\angle AYB$.

Problem 2. Quadrilateral $ABCD$ is inscribed in a circle. Suppose that $m\angle ABC = \frac{1}{2}m\angle ADC$ and that $m\angle BAD = 24°$. Find the measure of the remaining angles in the quadrilateral.

Problem 3. Parallelogram $ABCD$ is inscribed in a circle. Diagonals $\overline{AC}$ and $\overline{BD}$ are joined and meet at O. Prove that O is the center of the circle.

Problem 4. Prove that the parallelogram $ABCD$ from Problem 3 is a rectangle.

Problem 5. (Bonus) In circle ABC, diameter $\overline{AC}$ and chord $\overline{AB}$ are drawn. At point B, tangent $\overleftrightarrow{XY}$ is drawn. From point A, $\overline{AD}$ is drawn perpendicular to $\overline{XY}$. Draw this. Show that $\overline{AB}$ bisects $\angle CAD$.