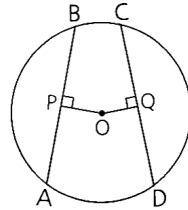


This homework is due Thursday, January 14, 2021.

**Problem 1.** In the figure below,  $AB = 3x + 15$ ,  $CQ = 20 - x$ ,  $OP = OQ = 8$ .



Find the radius of  $\odot OA$ .

**Problem 2.** Let  $A, B$  be points on a circle with center  $O$ , and let  $D$  be a point outside the circle. Suppose  $\overleftrightarrow{DA}$  and  $\overleftrightarrow{DB}$  are tangent to  $\odot OA$ . Show that  $\overline{DA} \cong \overline{DB}$ .

**Problem 3.** Let  $A, B, C, D$  be points on a circle with center  $O$ . Chords  $\overline{AB}$  and  $\overline{CD}$  are equally distant from center  $O$ . If  $AB = 3x - 1$  and  $CD = 2(10 - 2x)$ , find  $x$ ,  $AB$ , and  $CD$ .

**Problem 4.** Let  $A, B$  be points on a circle with center  $O$ , and let  $D$  be a point outside the circle. Construct two unique circles with centered at  $D$  and tangent to  $\odot OA$ .

**Problem 5.** Prove that the tangents drawn to a circle at both endpoints of a diameter are parallel.