Problem 1 – Chord-Chord Product Theorem

Page 1.3 shows circle *O* and two chords *AB* and *CD* that intersect at point *X*. The lengths *AX*, *BX*, *CX*, and *DX* are also given.

1. Move point *A* to four different points and collect the data in the table below and calculate the products ***AX*** · ***BX*** and ***CX*** · ***DX***.

Position	*AX*	*BX*	*CX*	*DX*	*AX* · *BX*	*CX* · *DX*
1						
2						
3						
4						

2. What do you notice about the products ***AX*** · ***BX*** and ***CX*** · ***DX***?

3. If two chords intersect in the interior of a circle, then the product of the lengths of the segments of one chord is _____ to the product of the lengths of the segments of the other chord.

Problem 2 – Secant-Secant Product Theorem

Page 2.2 shows circle *O* and two chords *AB* and *CD* that intersect at point *X*. The lengths *AX*, *BX*, *CX*, and *DX* are also given.

4. Move point *A* to four different points and collect the data in the table below and calculate the products ***AX*** · ***BX*** and ***CX*** · ***DX***.

Position	*AX*	*BX*	*CX*	*DX*	*AX* · *BX*	*CX* · *DX*
1						
2						
3						
4						

5. What do you notice about the products ***AX*** · ***BX*** and ***CX*** · ***DX***?

6. If two secant segments share the same endpoint outside of a circle, then the product of the lengths of one secant segment and its external segment _____ the product of the lengths of the other secant segment and its external segment.

Problem 3 – Secant-Tangent Product Theorem

Page 3.2 shows circle *O* and two chords *AB* and *CD* that intersect at point *X*. The lengths *AX*, *CX*, and *DX* are also given.

7. Move point *A* to four different points and collect the data in the table below and calculate $\boldsymbol{AX^2}$ and $\boldsymbol{CX \cdot DX}$.

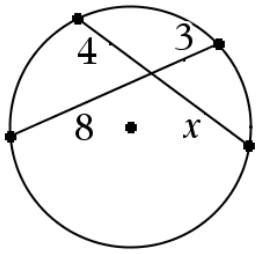
Position	*AX*	*CX*	*DX*	AX^2	$CX \cdot DX$
1					
2					
3					
4					

8. What do you notice about the products $\boldsymbol{AX^2}$ and $\boldsymbol{CX \cdot DX}$?

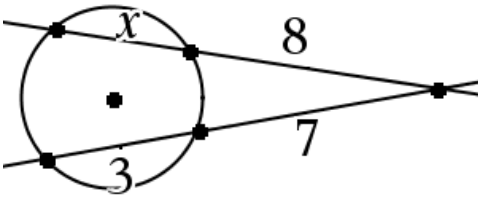
9. If a secant segment and a tangent segment share an endpoint outside of a circle, then the product of the lengths of the secant segment and its external segment _____ the square of the length of the tangent segment.

Problem 4 – Application of Product Theorems

10. Find the value of *x*.



11. Find the value of *x*.



12. Find the value of *x*.