Circle Product Theorems

Student Activity

Name _____

Class _____

Problem 1 – Chord-Chord Product Theorem

Start the Cabri Jr. application by pressing apps and selecting **CabriJr**. Open the file *PRODUC1* by pressing y=, selecting **Open…** and selecting the file.

PRODUC1 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 $AX \cdot BX$ and $CX \cdot DX$.

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

2. What do you notice about the products $AX \cdot BX$ and $CX \cdot DX$?

3. Summarize the relationship between the lengths of the segments of two chords if the two chords intersect in the interior of a circle.

Problem 2 – Secant-Secant Product Theorem

Open the file *PRODUC2*, which 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 $AX \cdot BX$ and $CX \cdot DX$.

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

5. What do you notice about the products $AX \cdot BX$ and $CX \cdot DX$?

6. Summarize the relationship between the lengths of the secant segments and their external segments if the two secant segments share the same endpoint outside of a circle.

Problem 3 – Secant-Tangent Product Theorem

Open the file *PRODUC3*, which 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 AX^2 and $CX \cdot DX$.

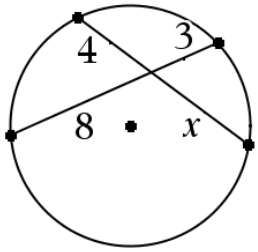
Position	*AX*	*CX*	*DX*	AX^2	$CX \cdot DX$
1					
2					
3					
4					

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

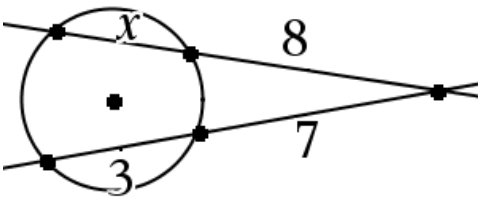
9. Summarize the relationship between the lengths of the secant segment, its external segment, and the tangent segment if the secant and tangent segments share the same endpoint outside of a circle.

Problem 4 – Application of Product Theorems

10. Find the value of *x*.



11. Find the value of *x*.



12. Find the value of *x*.