Radii and Chords

Perpendicular to a Chord Theorem: The perpendicular from the center of the circle to any chord bisects the chord.

Center to Chord Midpoint Theorem: The line joining the center of the circle to the midpoint of any chord which is not a diameter is perpendicular to the chord.

Perpendicular Bisector Chord to Center Theorem: The perpendicular bisector of a chord of a circle passes through the center of the circle.

Perpendicular Bisector Chord to Central Angle Theorem: The perpendicular bisector of a chord of a circle bisects the central angle subtended by the chord.

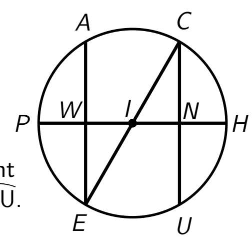
Central Angle Bisector Theorem: The bisector of a central angle subtended by the chord is the perpendicular bisector of the chord.

Distance–Chord Theorem: In the same circle or in congruent circles, chords are congruent if and only if their distances from the center(s) of the circle(s) are equal.

Chord – Arc Congruence Theorem: In a circle or in congruent circles, two minor arcs are congruent if and only if their corresponding chords are congruent.

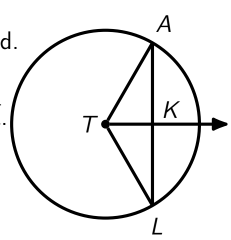
Practice Exercises

A. In $\odot I$, $\overline{PH}$ and $\overline{CE}$ are diameters with $\overline{PH} \perp \overline{AE}$ and $\overline{PH} \perp \overline{CU}$.



1. Name the midpoint of $\overline{PH}$.
2. Name the midpoint of $\overline{CE}$.
3. Name the midpoint of $\overline{AE}$.
4. Name the midpoint of $\overline{CU}$.
5. If $\overline{IW} \cong \overline{IN}$, name a chord congruent to $\overline{AE}$ and an arc congruent to $\overset{\frown}{CHU}$.
6. Name two arcs congruent to $\overset{\frown}{AP}$.

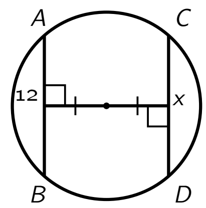
B. In $\odot T$, $\overline{AT}$ is a radius and $\overline{AL}$ is a chord.



1. If $\overline{TK} \perp \overline{AL}$, then $\overline{TK}$____ $\overline{AL}$.
2. If $\overrightarrow{TK}$ bisects $\angle ATL$, then $\overrightarrow{TK}$____ $\overline{AL}$.
3. If $\overrightarrow{TK}$ is a perpendicular bisector of $\overline{AL}$, then $\overrightarrow{TK}$____ $\angle ATL$.
4. The altitude $\overrightarrow{TK}$ to the base of ΔATL is also a ____.

Problem Set

Find the value of x in each figure.

1.


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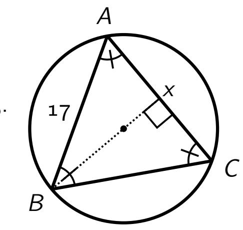

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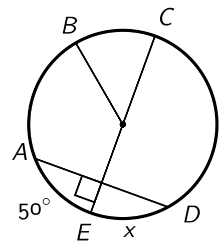

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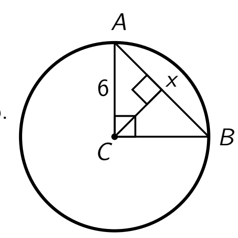

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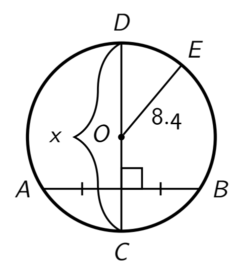

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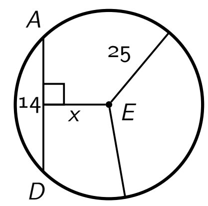

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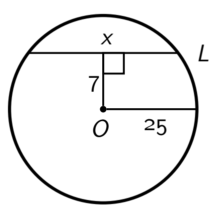

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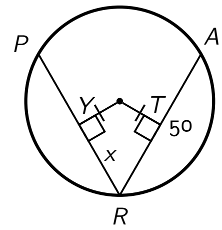

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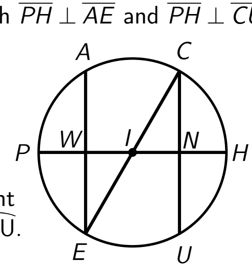

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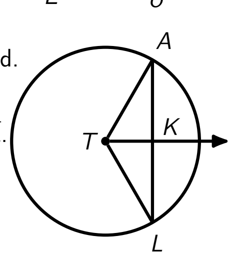

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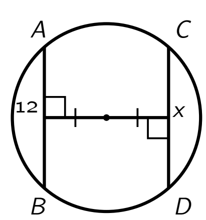

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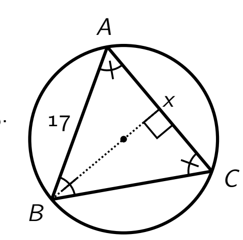

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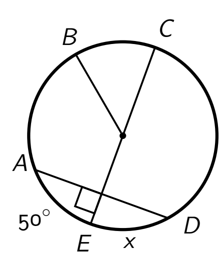

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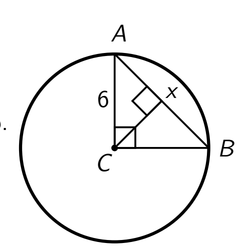

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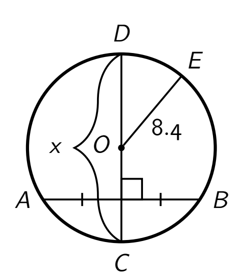

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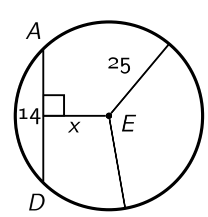

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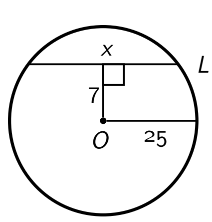

8.