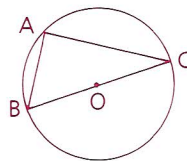


Problem 2 In circle O , $\overline{BC}$ is a diameter and the radius of the circle is 20.5 mm. Chord $\overline{AC}$ has a length of 40 mm. Find AB .



Solution

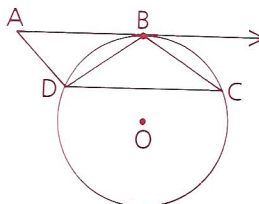
Since $\angle A$ is inscribed in a semicircle, it is a right angle. By the Pythagorean Theorem,

$$(AB)^2 + (AC)^2 = (BC)^2$$

$$(AB)^2 + 40^2 = 41^2$$

$$AB = 9 \text{ mm}$$

Problem 3 Given: $\odot O$ with $\overleftrightarrow{AB}$ tangent at B , $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$
Prove: $\angle C \cong \angle BDC$



Proof

1 $\overleftrightarrow{AB}$ is tangent to $\odot O$.

2 $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$

3 $\angle ABD \cong \angle BDC$

4 $\angle C \cong \angle ABD$

5 $\angle C \cong \angle BDC$

1 Given

2 Given

3 $\parallel$ lines $\Rightarrow$ alt. int. $\angle$ s $\cong$

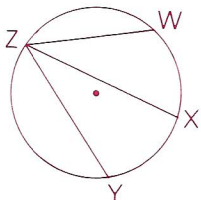
4 If an inscribed $\angle$ and a tangent-chord $\angle$ intercept the same arc, they are $\cong$.

5 Transitive Property

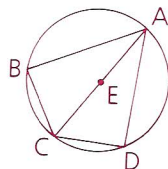
Part Three: Problem Sets

Problem Set A

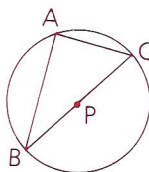
1 Given: X is the midpt. of $\widehat{WY}$.
Prove: $\overrightarrow{ZX}$ bisects $\angle WZY$.



2 Given: $\odot E$ with diameter $\overline{AC}$, $\overline{BC} \cong \overline{CD}$
Conclusion: $\triangle ABC \cong \triangle ADC$



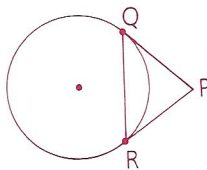
3 In $\odot P$, $\overline{BC}$ is a diameter, $AC = 12$ mm, and $BA = 16$ mm. Find the radius of the circle.



Problem Set A, continued

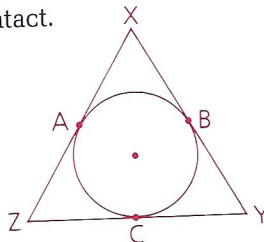
- 4 Given: $\overline{PQ}$ and $\overline{PR}$ are tangent segments.
 $\widehat{QR} = 163^\circ$

Find: **a** $\angle P$
b $\angle PQR$



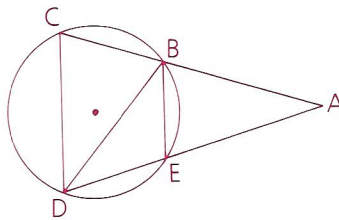
- 5 Given: A, B, and C are points of contact.
 $\widehat{AB} = 145^\circ$, $\angle Y = 48^\circ$

Find: $\angle Z$



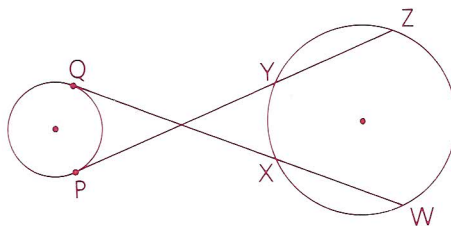
- 6 Given: $\widehat{BC} \cong \widehat{ED}$, $AB = 8$,
 $BC = 4$, $CD = 9$

a Are $\overline{BE}$ and $\overline{CD}$ parallel?
b Find BE.
c Is $\triangle ACD$ scalene?

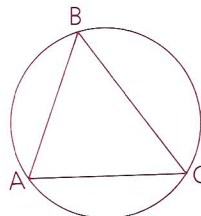


- 7 Given: $\overrightarrow{PY}$ and $\overrightarrow{QW}$ are tangents.
 $\widehat{WZ} = 126^\circ$, $\widehat{XY} = 40^\circ$

Find: $\widehat{PQ}$

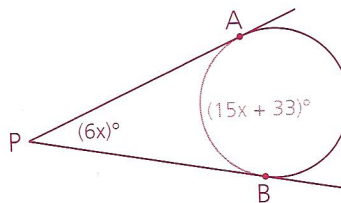


- 8 If $\triangle ABC$ is inscribed in a circle and
 $\widehat{AC} \cong \widehat{AB}$, tell whether each of the following must be true, could be true, or cannot be true.

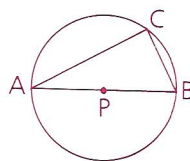


- a** $\overline{AB} \cong \overline{AC}$
b $\overline{AC} \cong \overline{BC}$
c $\overline{AB}$ and $\overline{AC}$ are equidistant from the center of the circle.
d $\angle B \cong \angle C$
e $\angle BAC$ is a right angle.
f $\angle ABC$ is a right angle.

- 9 In the figure shown, find $m\angle P$.



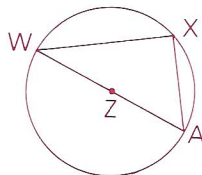
- 10 If $\overline{AB}$ is a diameter of $\odot P$, $CB = 1.5$ m, and $CA = 2$ m, find the radius of $\odot P$.



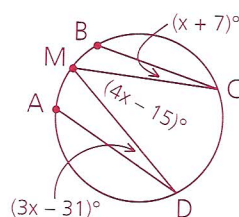
- 11 The radius of $\odot Z$ is 6 cm and $\widehat{WX} = 120^\circ$.

Find: a AX

b The perimeter of $\triangle WAX$



- 12 M is the midpoint of $\widehat{AB}$. Find $m\widehat{CD}$.



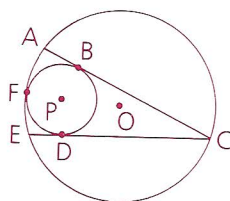
Problem Set B

- 13 A rectangle with dimensions 18 by 24 is inscribed in a circle. Find the radius of the circle.

- 14 A square is inscribed in a circle with a radius of 10. Find the length of a side of the square.

- 15 Quadrilateral ABCD is inscribed in circle O. $AB = 12$, $BC = 16$, $CD = 10$, and $\angle ABC$ is a right angle. Find the measure of $\widehat{AD}$ in simplified radical form.

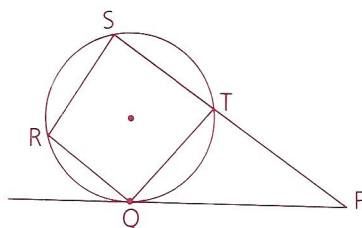
- 16 Circles O and P are tangent at F. $\overline{AC}$ and $\overline{CE}$ are tangent to $\odot P$ at B and D. If $\widehat{DFB} = 223^\circ$, find $\widehat{AE}$.



- 17 Given: $\angle S = 88^\circ$, $\widehat{QT} = 104^\circ$, $\widehat{ST} = 94^\circ$,
tangent $\overline{PQ}$

Find: a $\angle P$

b $\angle STQ$



- 18 Given: $\widehat{BC} \cong \widehat{CD}$

Conclusion: $\triangle ABC \sim \triangle AED$

