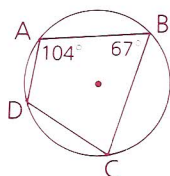


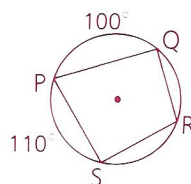
Part Three: Problem Sets

Problem Set A

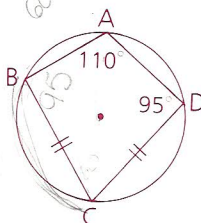
- 1 Given: $\angle A = 104^\circ$, $\angle B = 67^\circ$
Find: $\angle D$ and $\angle C$



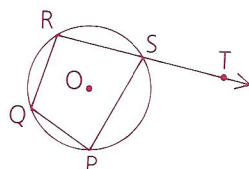
- 2 Given: $\widehat{PS} = 110^\circ$, $\widehat{PQ} = 100^\circ$
Find: $m\angle R$ and $m\angle P$



- 3 Given: $\angle A = 110^\circ$, $\overline{BC} \cong \overline{CD}$, $\angle D = 95^\circ$
Find: a $\angle C$ c $\angle B$
b $\widehat{BC}$ d $\widehat{AB}$



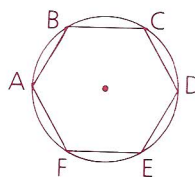
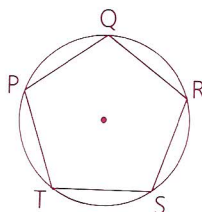
- 4 Given: $\odot O$
Prove: $\angle Q \cong \angle PST$



- 5 Can a parallelogram with a 100° angle be inscribed in a circle?

- 6 Given: PQRST is a regular pentagon.
ABCDEF is a regular hexagon.

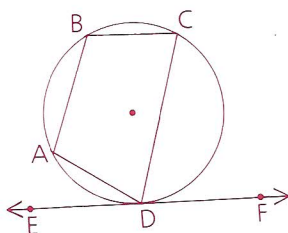
- Find: a $m\widehat{PQ}$ d $m\widehat{BD}$
b $m\widehat{RT}$ e $m\widehat{DEA}$
c $m\widehat{AB}$



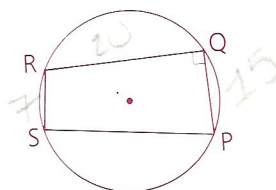
- 7 a If a rhombus is inscribed in a circle, what must be true about the rhombus?
b If a trapezoid is inscribed in a circle, what must be true about the trapezoid?
- 8 Prove: The bisector of an angle of an inscribed triangle also bisects the arc cut off by the opposite side.

Problem Set B

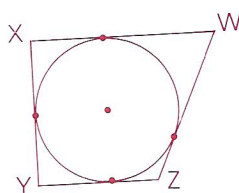
- 9 Given: $\angle B = 115^\circ$, $\widehat{AD} = 60^\circ$, $\overline{BC} \parallel \overline{EF}$
 Find: a $\angle ADC$ c $\angle C$
 b $\angle CDF$ d $\angle A$



- 10 $PQ = 15$, $QR = 20$, $RS = 7$, and $\angle Q$ is a right angle. Find PS .



- 11 Trapezoid $WXYZ$ is circumscribed about circle O . $\angle X$ and $\angle Y$ are right $\angle$ s, $XW = 16$, and $YZ = 7$. Find the perimeter of $WXYZ$.

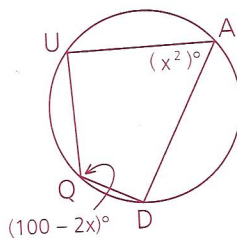


- 12 A circle is inscribed in a square with vertices $(-8, -3)$, $(-1, -3)$, $(-8, 4)$, and $(-1, 4)$.
 a Find the coordinates of the center of the circle.
 b Find the area of the circle.
 c Find the radius of a circle circumscribed about the square.

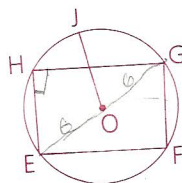
- 13 Prove: A trapezoid inscribed in a circle is isosceles.

- 14 Parallelogram $RECT$ is inscribed in circle O . If $RE = 6$ and $EC = 8$, find the perimeter of $\triangle ECO$.

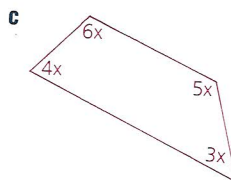
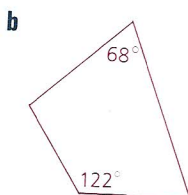
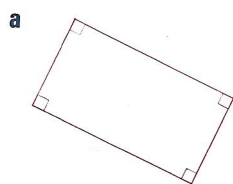
- 15 Given the figure shown, find $m\angle Q$.



- 16 Given: $\odot O$; $EFGH$ is a $\square$.
 $\widehat{HG} = 120^\circ$, $OJ = 6$
 Find: The perimeter of $EFGH$



- 17 A quadrilateral can be inscribed in a circle only if a pair of opposite angles are supplementary. Which of the following quadrilaterals can be inscribed in a circle?

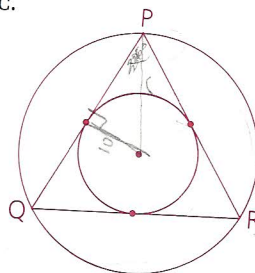


- 18 Prove: Any isosceles trapezoid can be inscribed in a circle.
(Hint: See problem 17.)

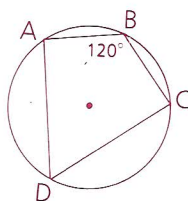
- 19 Equilateral triangle PQR is inscribed in one circle and circumscribed about another circle. The circles are concentric.

- a If the radius of the smaller circle is 10, find the radius of the larger circle.

- b In general, for an equilateral triangle, what is the ratio of the radius of the inscribed circle to the radius of the circumscribed circle?



- 20 ABCD is a kite, with $\overline{AB} \cong \overline{BC}$, $\overline{AD} \cong \overline{CD}$, and $m\angle B = 120$. The radius of the circle is 3. Find the perimeter of ABCD.



Problem Set C

- 21 Discuss the location of the center of a circle circumscribed about each of the following types of triangles.
- a Right b Acute c Obtuse
- 22 A set of points are *concylic* if they all lie on the same circle. Prove that the vertices of any triangle are concyclic.
- 23 Are the vertices of each figure concyclic Always, Sometimes, or Never?
- a A rectangle d A nonisosceles trapezoid
b A parallelogram e An equilateral polygon
c A rhombus f An equiangular polygon
- 24 A right triangle has legs measuring 5 and 12. Find the ratio of the area of the inscribed circle to the area of the circumscribed circle.