AMDG

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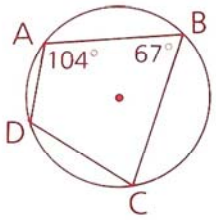
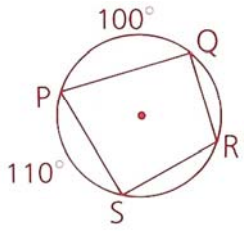
10-7: Inscribed and Circumscribed Circles

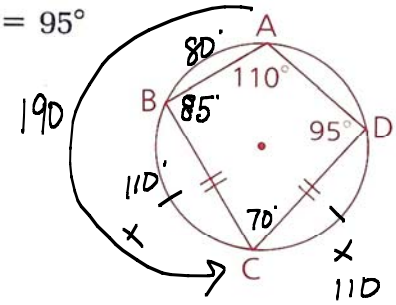
1 Given: $\angle A = 104°$, $\angle B = 67°$
Find: $\angle D$ and $\angle C$



2 Given: $\overset{\frown}{PS} = 110°$, $\overset{\frown}{PQ} = 100°$
Find: $m\angle R$ and $m\angle P$



3 Given: $\angle A = 110°$, $\overline{BC} \cong \overline{CD}$, $\angle D = 95°$
Find: **a** $\angle C$ 70° **c** $\angle B$ 85°
b $\overset{\frown}{BC}$ 110° **d** $\overset{\frown}{AB}$ 80°



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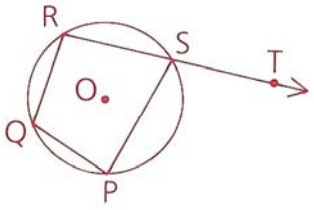
$\angle BAD \rightarrow \overset{\frown}{DCB}$

$110 \rightarrow \frac{\overset{\frown}{DCB}}{2}$

$220 \rightarrow \overset{\frown}{DCB}$

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



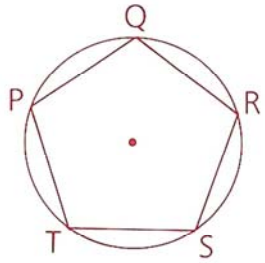
Statements	Reasons
1. $\odot O$	1. Given
2. $\angle Q$ supp $\angle RSP$	2. Inscrib Quad $\Rightarrow$ opp $\angle$s supp
3. $\angle TSP$ supp $\angle RSP$	3. s+$\angle$ $\Rightarrow$ supp$\angle$s
4. $\angle Q \cong \angle PST$	4. $\angle$s supp same $\angle$ are $\cong$

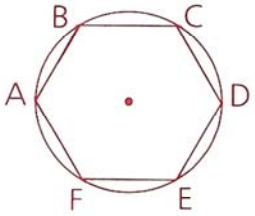
5 Can a parallelogram with a 100° angle be inscribed in a circle?

↳ No only Parallelograms that are rectangle can be inscribed.

6 Given: PQRST is a regular pentagon. $360/5 = 72°$
ABCDEF is a regular hexagon.

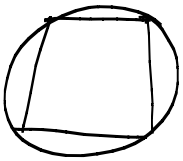
Find: **a** $m\overset{\frown}{PQ} = 72°$ **d** $m\overset{\frown}{BD}$
b $m\overset{\frown}{RT}$ **e** $m\overset{\frown}{DEA}$
c $m\overset{\frown}{AB}$



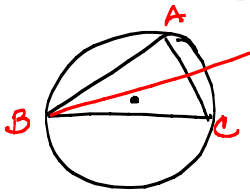


7 **a** If a rhombus is inscribed in a circle, what must be true about the rhombus? It must be square (→ parallel)

b If a trapezoid is inscribed in a circle, what must be true about the trapezoid? ISOS trap



8 Prove: The bisector of an angle of an inscribed triangle also bisects the arc cut off by the opposite side.



$\angle B = \frac{\overset{\frown}{AC}}{2}$

$\frac{1}{2}\angle B = \frac{\overset{\frown}{AC}}{2} \cdot \frac{1}{2}$

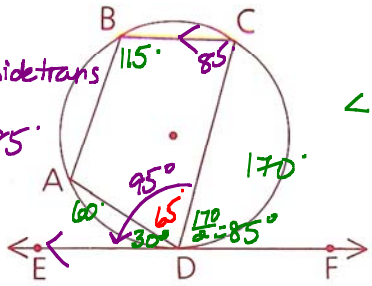
$\frac{\angle B}{2} = \frac{\overset{\frown}{AC}}{4}$

9 Given: $\angle B = 115°$, $\overset{\frown}{AD} = 60°$, $\overline{BC} \parallel \overline{EF}$

Find: **a** $\angle ADC$ 65° **c** $\angle C$ ||→ int∠s same side trans are supp $180 - 95 = 85°$
b $\angle CDF = 85°$ **d** $\angle A$

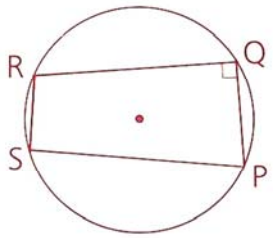
7,10
180
−115
65

180
−85
95

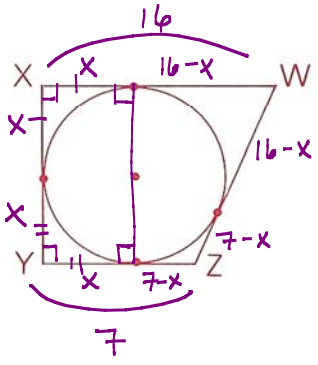


$\angle B = 115 \rightarrow \overset{\frown}{CDA} = 230°$
$-\overset{\frown}{AD} \quad -60°$
$\overset{\frown}{CD} = 170°$

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



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



XW + XY + YZ + WZ
X+16−X + 2x + 7 + 16−x + 7−x
16 + 2x + 7 + 23 − 2x
46

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.

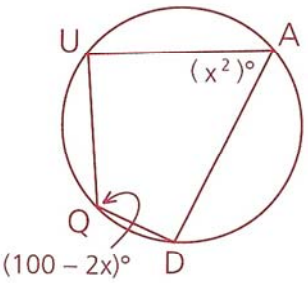
b Find the area of the circle.

c Find the radius of a circle circumscribed about the square.

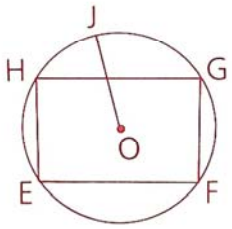
13 Prove: A trapezoid inscribed in a circle is isosceles.

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 $m\angle Q$.

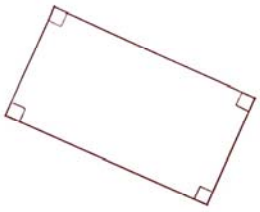


16 Given: $\odot O$; EFGH is a $\square$.
$\overset{\frown}{HG} = 120°$, $OJ = 6$
Find: The perimeter of EFGH

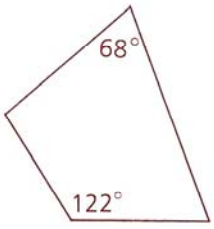


17 A quadrilateral can be inscribed in a circle only if a pair of opposite angles are supplementary. Which of the following quadrilaterals can be inscribed in a circle?

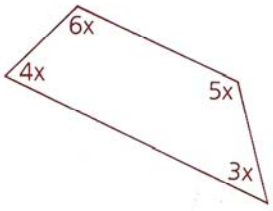
a



b

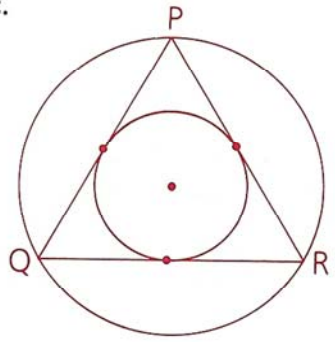


c



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.