NAME Student

Adv Geo 1

10-7: Inscribed and Circumscribed Circles

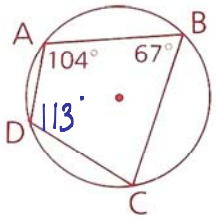
AMDG

Ms. Kresovic

T 30 Apr 2013

1 Given: $\angle A = 104°$, $\angle B = 67°$

Find: $\angle D$ and $\angle C$



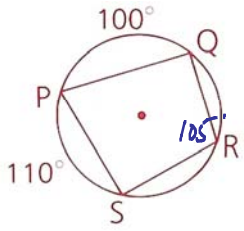
inscribed quad ⇒ opp ∠s supp

$\angle D = 180 - 67 = 113°$

$\angle C = 180 - 104$

2 Given: $\overset{\frown}{PS} = 110°$, $\overset{\frown}{PQ} = 100°$

Find: $m\angle R$ and $m\angle P$

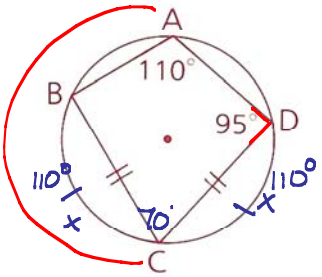


$105°$ $180 - 105 = 75°$

$\angle R = \frac{\overset{\frown}{SPQ}}{2} = \frac{\overset{\frown}{SP} + \overset{\frown}{PQ}}{2} = \frac{210}{2} = 105°$

3 Given: $\angle A = 110°$, $\overline{BC} \cong \overline{CD}$, $\angle D = 95°$

Find: **a** $\angle C$ **b** $\overset{\frown}{BC}$ **c** $\angle B = 180 - 95 = 85°$ **d** $\overset{\frown}{AB} = 80°$



$\angle C$ supp $\angle A$

$180 - 110$

$70°$

$\angle A = \frac{\overset{\frown}{BC} + \overset{\frown}{CD}}{2}$

$110 = \frac{2x}{2}$

$110 = x$

$\angle D = \frac{\overset{\frown}{ABC}}{2} = \frac{\overset{\frown}{AB} + \overset{\frown}{BC}}{2}$

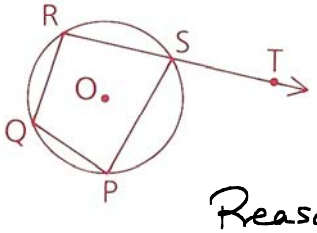
$95° = \frac{\overset{\frown}{AB} + 110}{2}$

$190 = \overset{\frown}{AB} + 110$

$80 = \overset{\frown}{AB}$

4 Given: $\odot O$

Prove: $\angle Q \cong \angle PST$



Statements	Reasons
1. $\odot O$	1. Given
2. $\angle Q$ supp $\angle RSP$	2. inscribed quad ⇒ opp ∠s supp
3. $\angle PST$ supp $\angle RSP$	3. st∠ ⇒ supp∠s
4. $\angle Q \cong \angle PST$	4. ∠s supp to same ∠ are ≅

→ Rex ⇒ m∠ = 90°

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

No

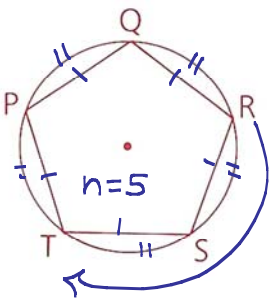
6 Given: PQRST is a regular pentagon.
ABCDEF is a regular hexagon.

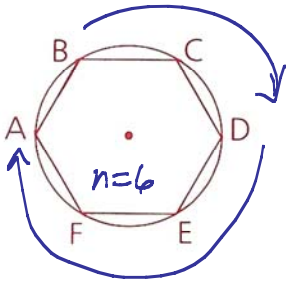
Find: **a** $m\overset{\frown}{PQ} = \frac{360}{5} = 72°$ **d** $m\overset{\frown}{BD} = 2(60) = 120°$

b $m\overset{\frown}{RT} = 2(72) = 144°$ **e** $m\overset{\frown}{DEA} = 3(60) = 180°$

c $m\overset{\frown}{AB} = \frac{360}{6} = 60°$

≅ chds ⇒ ≅ arcs





7 **a** If a rhombus is inscribed in a circle, what must be true about the rhombus?

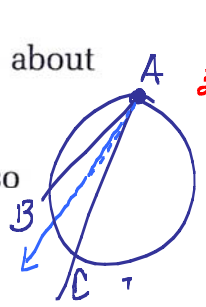
→ parallelogram rt∠s

Square

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.



$\frac{1}{2}\angle A = \frac{\overset{\frown}{BC}}{2} \cdot \frac{1}{2}$

$\frac{1}{2}\angle A = \frac{\overset{\frown}{BC}}{4}$

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

Find: **a** $\angle ADC$ **c** $\angle C$ ∥ ⇒ Alt int ∠s ≅ : 85°

b $\angle CDF$ **d** $\angle A$

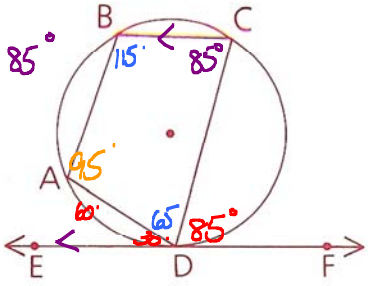
inscribed quad ⇒ opp ∠s supp

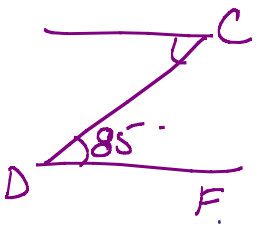
$\angle B + \angle D = 180$

$\angle D = 180 - 115 = 65$

180 − 95 = 85

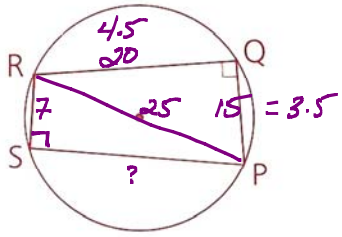
180 − 85 = 95°



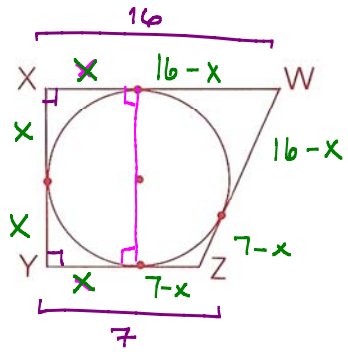


10 PQ = 15, QR = 20, RS = 7, and ∠Q is a right angle. Find PS.

special → 24



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 + WZ + ZY + YX

16 + 23 − 2x + 7 + 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.

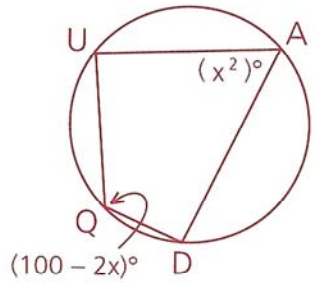
b Find the area of the circle.

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

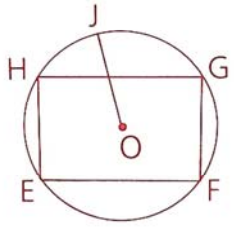
13 Prove: A trapezoid inscribed in a circle is isosceles.

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 $m\angle Q$.

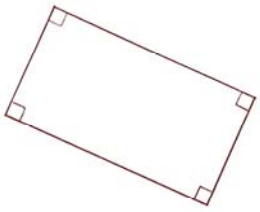


16 Given: $\odot O$; EFGH is a $\square$.
$\overset{\frown}{HG} = 120°$, OJ = 6
Find: The perimeter of EFGH

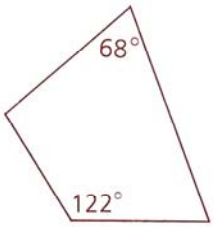


17 A quadrilateral can be inscribed in a circle only if a pair of opposite angles are supplementary. Which of the following quadrilaterals can be inscribed in a circle?

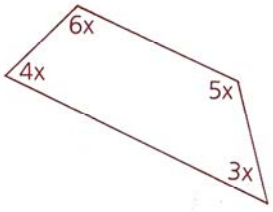
a



b

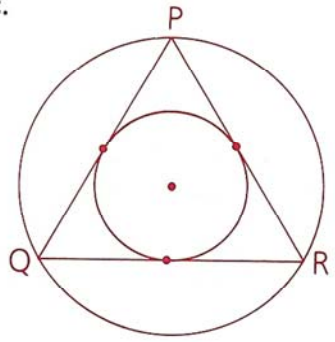


c



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.