

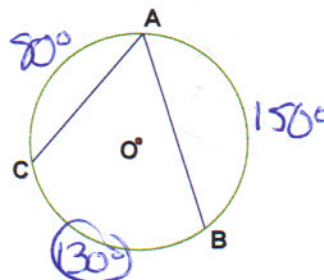
Name Schlansky
Mr. Schlansky

Date _____
Geometry

Circles Regents Review

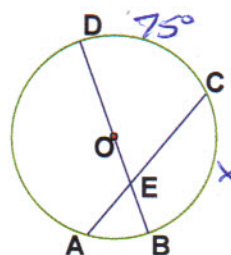
1. In circle O, $m\widehat{CA} = 80^\circ$ and $m\widehat{AB} = 150^\circ$. Find $m\widehat{BC}$

$$\begin{array}{r} 150 + 80 + x = 360 \\ 230 + x = 360 \\ -230 \quad -230 \\ x = 130 \end{array}$$



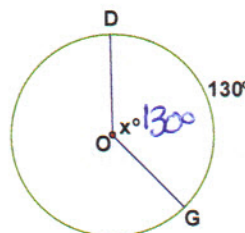
2. In circle O, $m\widehat{DC} = 75^\circ$, find $m\widehat{CB}$

$$\begin{array}{r} 75 + x = 180 \\ -75 \quad -75 \\ x = 105 \end{array}$$



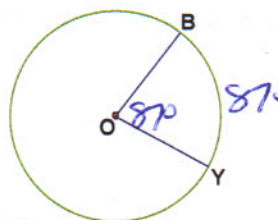
3. If $\widehat{DG} = 130^\circ$, find the measure of $\angle DOG$.

$$130^\circ$$



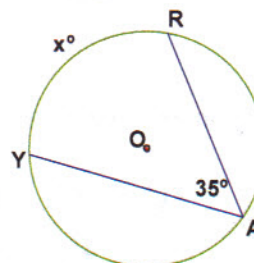
4. If $\angle BOY = 87^\circ$, find the measure of \widehat{BY} .

$$87^\circ$$



5. If $\angle RAY = 35^\circ$, find \widehat{RY}

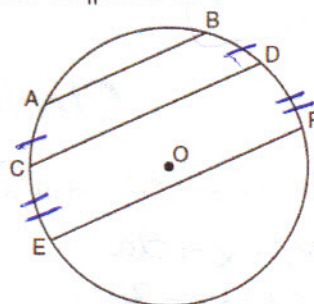
$$2(35) = 70$$



6. In the diagram below of circle O , chord $\overline{AB} \parallel$ chord \overline{CD} , and chord $\overline{CD} \parallel$ chord \overline{EF} .

Which statement must be true?

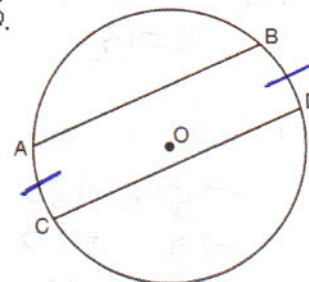
- 1) $\widehat{CE} \cong \widehat{DF}$ ✓
 2) $\widehat{AC} \cong \widehat{DF}$ ✗
 3) $\widehat{AC} \cong \widehat{CE}$ ✗
 4) $\widehat{EF} \cong \widehat{CD}$ ✗



7. In the diagram below of circle O , chord \overline{AB} is parallel to chord \overline{CD} .

Which statement must be true?

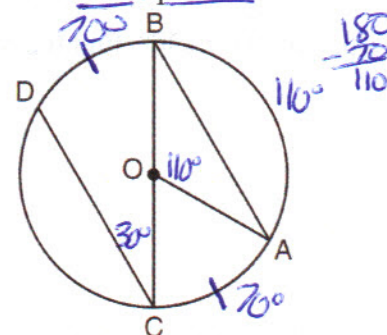
- 1) $\widehat{AC} \cong \widehat{BD}$ ✓
 2) $\widehat{AB} \cong \widehat{CD}$ ✗
 3) $\widehat{AB} \cong \widehat{CD}$ ✗
 4) $\widehat{ABD} \cong \widehat{CDB}$ ✗



8. In the diagram below of circle O with diameter \overline{BC} and radius \overline{OA} , chord \overline{DC} is parallel to chord \overline{BA} .

If $m\angle BCD = 30^\circ$, determine and state $m\angle AOB$.

110°



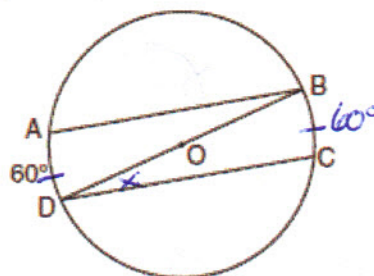
9. In the diagram of circle O below, chords \overline{AB} and \overline{CD} are parallel, and \overline{BD} is a diameter of the circle.

If $m\widehat{AD} = 60$, what is $m\angle CDB$?

- 1) 20
 2) 30

- 3) 60
 4) 120

$$\frac{1}{2}(60) = 30^\circ$$



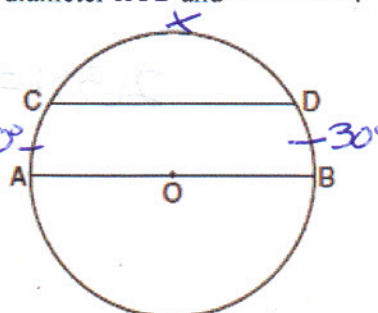
10. In the diagram of circle O below, chord \overline{CD} is parallel to diameter \overline{AOB} and $m\widehat{AC} = 30$.

What is $m\widehat{CD}$?

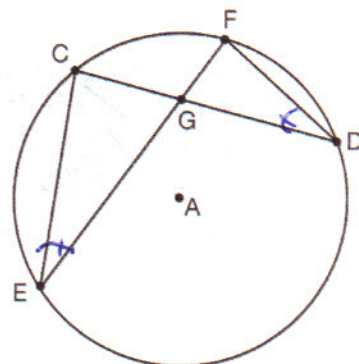
- 1) 150
 2) 120

- 3) 100
 4) 60

$$\begin{aligned} 30 + x + 30 &= 180 \\ x + 60 &= 180 \\ -60 &-60 \\ x &= 120 \end{aligned}$$



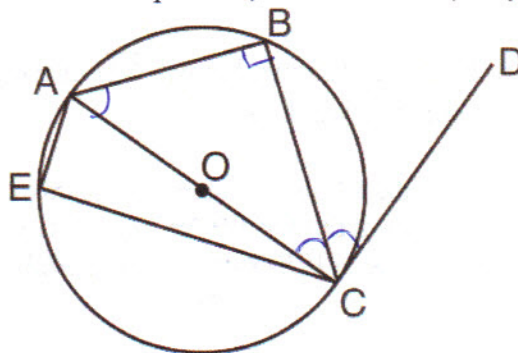
11. In the diagram of circle A shown below, chords \overline{CD} and \overline{EF} intersect at G , and chords \overline{CE} and \overline{FD} are drawn.



Which statement is *not* always true?

- 1) $\overline{CG} \cong \overline{FG}$ ✗
- 2) $\angle CEG \cong \angle FDG$ inscribed to same arc ✓
- 3) $\frac{CE}{EG} = \frac{FD}{DG}$ In proportion ✓
- 4) $\triangle CEG \sim \triangle FDG$ ✓

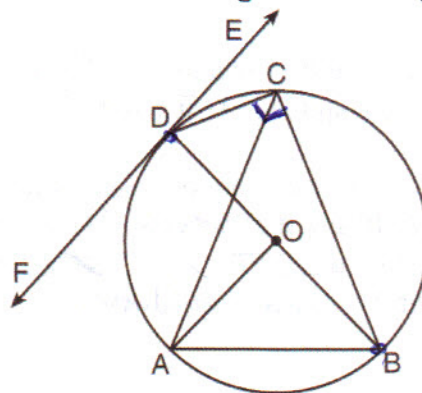
12. In circle O shown below, diameter \overline{AC} is perpendicular to \overline{CD} at point C , and chords \overline{AB} , \overline{BC} , \overline{AE} , and \overline{CE} are drawn.



Which statement is *not* always true?

- 1) $\angle ACB \cong \angle BCD$ ✗
- 2) $\angle ABC \cong \angle ACD$ inscribed to diameter/tangent-diameter ✓
- 3) $\angle BAC \cong \angle DCB$ inscribed to same arc ✓
- 4) $\angle CBA \cong \angle AEC$ both inscribed to diameter ✓

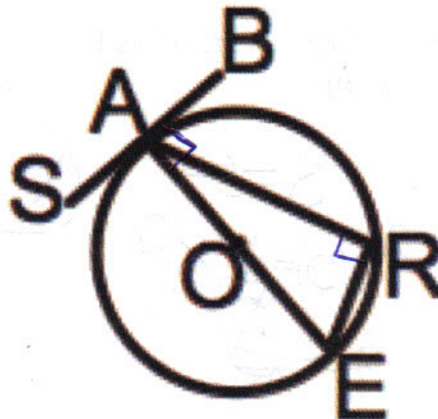
13. In the diagram below, \overline{DC} , \overline{AC} , \overline{DOB} , \overline{CB} , and \overline{AB} are chords of circle O , \overleftrightarrow{FDE} is tangent at point D , and radius \overline{AO} is drawn. Sam decides to apply this theorem to the diagram: "An angle inscribed in a semi-circle is a right angle."



Which angle is Sam referring to?

- 1) $\angle AOB$ ✗
- 2) $\angle BAC$ ✗
- 3) $\angle DCB$ ✓
- 4) $\angle FDB$ ✗ right angle but because tangent-diameter

14. In circle O shown below, \overline{AE} is a diameter, \overline{SB} is a tangent, and chord \overline{AR} and \overline{RE} are drawn.



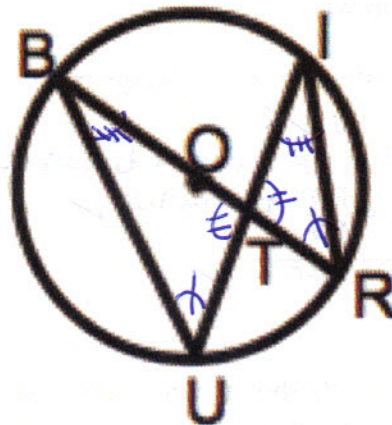
Which of the following statements is true?

- 1) $\angle EAR \cong \angle RAB$ ✗
- 2) $\angle REA \cong \angle SAE$ ✗
- 3) $\angle SAR \cong \angle BAE$ ✗
- 4) $\angle ERA \cong \angle BAE$ ✓

15. In circle O shown below, \overline{BR} is a diameter and chords \overline{BU} , \overline{IU} , and \overline{IR} are drawn.

Which of the following statements is *not* true?

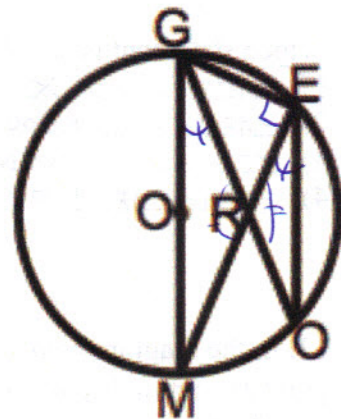
- 1) $\angle BUI \cong \angle BRI$ ✓ same arc
 2) $\angle ITR \cong \angle BTU$ ✓ vertical angles
 3) $\angle UBT \cong \angle BRI$ ✗
 4) $\angle RBU \cong \angle RIU$ ✓ same arc



16. In circle O shown below, \overline{GM} is a diameter and chords \overline{EM} , \overline{OG} , \overline{EG} and \overline{EO} are drawn.

Which of the following statements is *not* true?

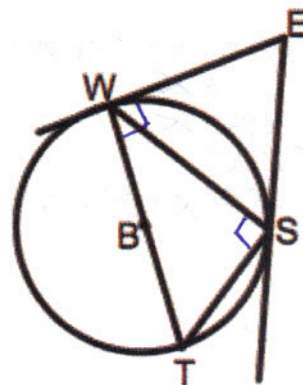
- 1) $\angle MEO \cong \angle OGM$ ✓ same arc
 2) $\angle GRM \cong \angle ORE$ ✓ vertical angles
 3) $\triangle MGR \cong \triangle EOR$ ✗ Similar, not congruent
 4) $\angle GEM$ is a right angle ✓ inscribed to diameter



17. In circle B shown below, \overline{TW} is a diameter, tangents \overline{EW} and \overline{ES} are drawn and chords \overline{WS} and \overline{TS} are drawn.

Which of the following statements is *not* true?

- 1) $\angle ESW \cong \angle WTS$ ✓ same arc
 2) $\angle WST \cong \angle EWT$ ✓ inscribed to diameter/tangent-diameter
 3) $\angle EWS \cong \angle ESW$ ✓ same arc
 4) $\angle TWS \cong \angle STW$ ✗



18. In circle O , the measure of central angle AOB is $\frac{\pi}{2}$ radians and the length of arc AB is 10 cm. What is the measure of radius \overline{OB} ?

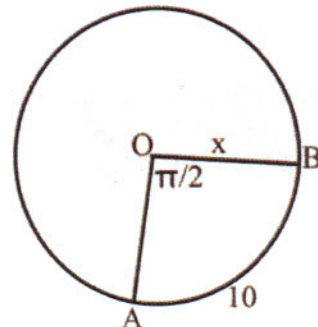
$$S = r\theta$$

$$2(10) = \left(\frac{\pi}{2}\right) \times r$$

$$20 = \frac{\pi}{2} r$$

$$r = \frac{40}{\pi}$$

$\theta = \frac{20}{r}$



19. What is the measure of the central angle below?

$$S = r\theta \quad \theta = 2.5$$

$$\frac{5}{2} = \frac{0.2}{2}$$



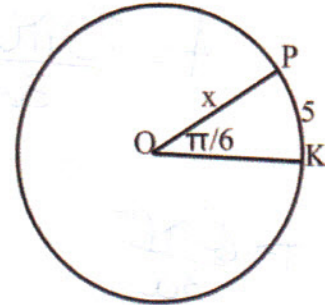
20. In circle O, the measure of central angle AOB is $\frac{\pi}{6}$ radians and the length of arc AB is 5. What is the measure of radius \overline{OP} ?

$$S = r\theta$$

$$6(5) = \pi(x)$$

$$\frac{30}{\pi} = x$$

$$\frac{30}{\pi} = x$$



21. In the diagram below, the circle shown has radius 10. Angle B intercepts an arc with a length of 2π .

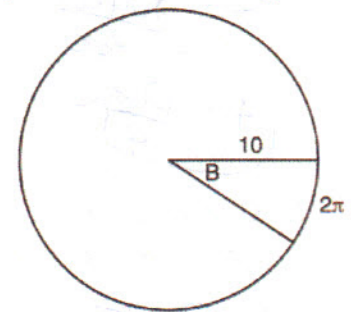
What is the measure of angle B, in radians?

- 1) $10 + 2\pi$
- 2) 20π
- 3) $\frac{\pi}{5}$
- 4) $\frac{5}{\pi}$

$$S = r\theta$$

$$\frac{2\pi}{10} = \frac{x(10)}{10}$$

$$x = \frac{\pi}{5}$$

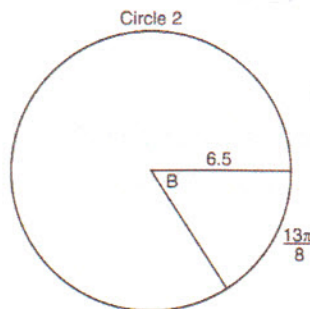
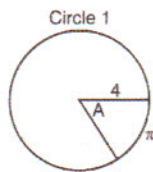


22. In the diagram below, Circle 1 has radius 4, while Circle 2 has radius 6.5. Angle A intercepts an arc of length π , and angle B intercepts an arc of length $\frac{13\pi}{8}$.

$$S = r\theta$$

$$\frac{\pi}{4} = \frac{0.4}{4}$$

$$\frac{\pi}{4} = 0$$



$$S = r\theta$$

$$\frac{13\pi}{8} = (6.5)\theta$$

$$\frac{13\pi}{52} = \frac{52\theta}{52}$$

$$\frac{\pi}{4} = \theta$$

Dominic thinks that angles A and B have the same radian measure. State whether Dominic is correct or not. Explain why.

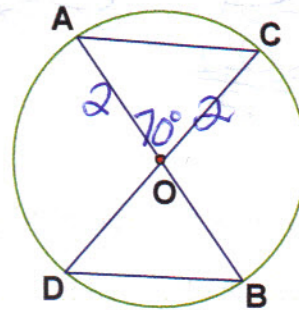
Yes, they both have a measure of $\frac{\pi}{4}$.

23. In circle O, $m\angle AOC = 70$ and $\overline{AO} = 2$ in. Find the area of sector COA to the nearest square inch.

$$\text{Area of a sector} = \frac{Q\pi r^2}{360}$$

$$A = \frac{70\pi(2)^2}{360}$$

$$A = 2 \text{ in}^2$$

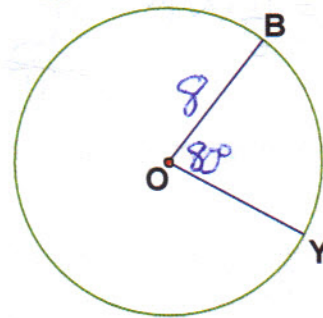


24. In circle O, if $\angle BOY = 80^\circ$ and $\overline{BO} = 8$ cm, find the area of sector BOY in terms of π .

$$A = \frac{Q\pi r^2}{360}$$

$$A = \frac{80\pi(8)^2}{360}$$

$$A = \frac{128\pi}{9}$$



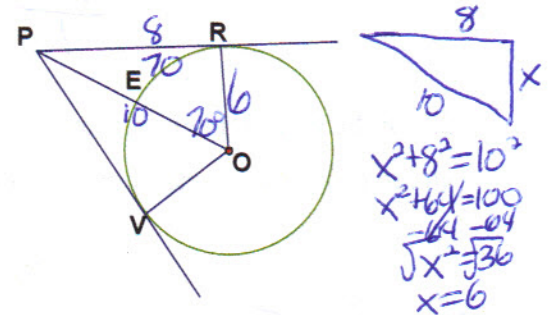
25. Given that circle O has tangents \overline{PR} and \overline{PV} , if $m\angle ER = 70$, $\overline{PO} = 10$ cm, and $\overline{PR} = 8$ cm find the area of sector ROE to the nearest tenth of a cm.

$$A = \frac{Q\pi r^2}{360}$$

$$A = \frac{70\pi(6)^2}{360}$$

$$A = 7\pi$$

$$A = 22.0$$

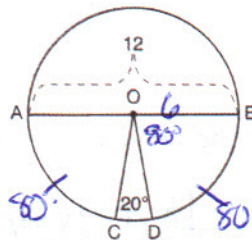


26. In the diagram below of circle O, diameter \overline{AB} and radii \overline{OC} and \overline{OD} are drawn. The length of \overline{AB} is 12 and the measure of $\angle COD$ is 20 degrees.

$$A = \frac{Q\pi r^2}{360}$$

$$A = \frac{80\pi(6)^2}{360}$$

$$A = 8\pi$$



$$x + 20 + x = 180$$

$$2x + 20 = 180$$

$$2x = 160$$

$$x = 80$$

If $\overline{AC} \cong \overline{BD}$, find the area of sector BOD in terms of π .

27. Triangle FGH is inscribed in circle O , the length of radius \overline{OH} is 6, and $\overline{FH} \cong \overline{OG}$.

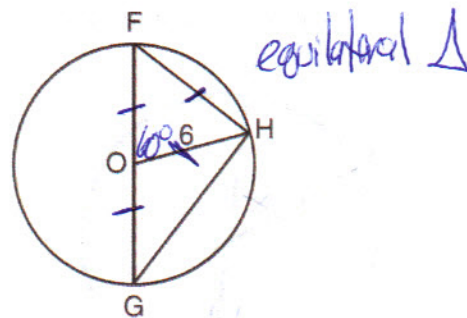
What is the area of the sector formed by angle FOH ?

- 1) 2π
- 2) $\frac{3}{2}\pi$
- 3) 6π
- 4) 24π

$$A = \frac{\theta \pi r^2}{360}$$

$$A = \frac{60 \pi (6)^2}{360}$$

$$A = 6\pi$$

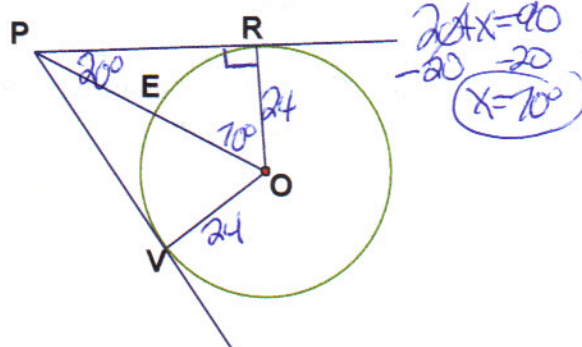


28. In circle O , tangents \overline{PR} and \overline{PV} are drawn. If $m\angle RPO = 20$ and $\overline{VO} = 24$ cm, find the area of sector ROE in terms of π .

$$A = \frac{\theta \pi r^2}{360}$$

$$A = \frac{70 \pi (24)^2}{360}$$

$$A = 112\pi$$



29. In the diagram below of circle O , the area of the shaded sector LOM is 2π cm².

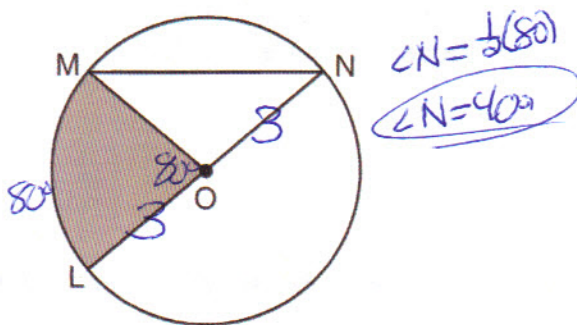
If the length of \overline{NL} is 6 cm, what is $m\angle N$?

- 1) 10°
- 2) 20°
- 3) 40°
- 4) 80°

$$A = \frac{\theta \pi r^2}{360}$$

$$2\pi = \frac{\theta \pi (3)^2}{360}$$

$$80 = \theta$$



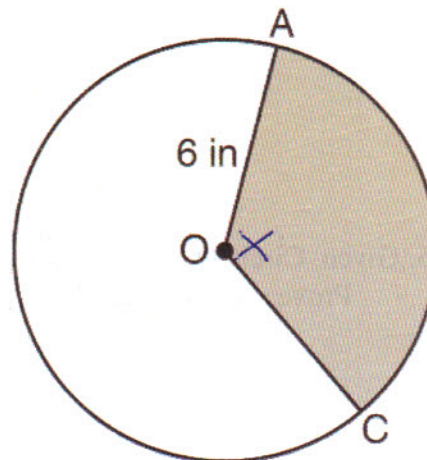
30. In the diagram below of circle O , the area of the shaded sector AOC is 12π in² and the length of \overline{OA} is 6 inches. Determine and state $m\angle AOC$.

$$A = \frac{\theta \pi r^2}{360}$$

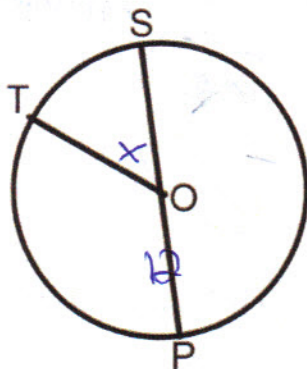
$$12\pi = \frac{x \pi (6)^2}{360}$$

$$4320\pi = 36\pi x$$

$$120 = x$$



31. In the diagram below of circle O , the area of sector STO is $48\pi \text{ in}^2$ and the length of \overline{OP} is 12 inches. Determine and state $m\angle SOT$



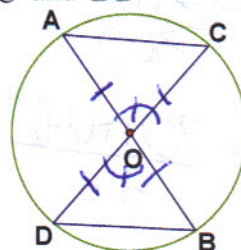
$$A = \frac{\theta}{360} \pi r^2$$

$$48\pi = \frac{x}{360} \pi (12)^2$$

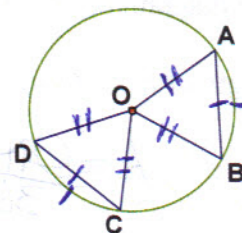
$$\frac{17280\pi}{144\pi} = \frac{144\pi x}{144\pi}$$

$$120^\circ = x$$

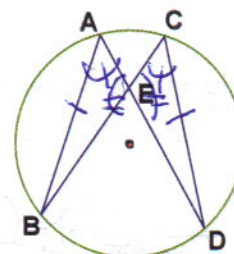
32. Given: Circle O with diameters \overline{AOB} and \overline{COD} , and chords \overline{AC} and \overline{DB}
Prove: $\overline{AC} \cong \overline{DB}$



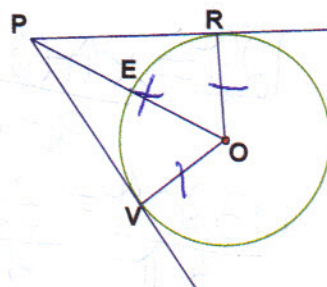
33. Given: Circle O with $\widehat{AB} \cong \widehat{CD}$
Prove: $\triangle ABO \cong \triangle CBO$



34. Given: Chords \overline{AD} and \overline{BC} of circle O intersect at E , $\overline{AB} \cong \overline{CD}$
Prove: $\overline{BC} \cong \overline{AD}$



35. Given: Circle O , tangents \overline{PR} , \overline{PV}
Prove: $\angle RPO \cong \angle VPO$



32) statements	Reasons
① $\overline{AO} \cong \overline{OB}$ $\overline{DO} \cong \overline{OC}$	① All radii of a circle are congruent
② $\angle AOC \cong \angle DOB$	② vertical angles are congruent
③ $\triangle AOC \cong \triangle DOB$	③ SAS \cong SAS
④ $\overline{AC} \cong \overline{DB}$	④ CPCTC

33) statements	Reasons
① $\overline{AB} \cong \overline{CD}$	① given
② $\overline{AB} \cong \overline{CD}$	② Congruent arcs have congruent chords
③ $\overline{AO} \cong \overline{OD}$ $\overline{OC} \cong \overline{OB}$	③ All radii are congruent
④ $\triangle ABO \cong \triangle CDO$	④ SSS \cong SSS

34) statements	Reasons
① $\overline{AB} \cong \overline{CD}$	① given
② $\angle BAD \cong \angle BCD$	② Angles inscribed to the same arc are congruent
③ $\angle AEB \cong \angle CED$	③ vertical angles are congruent
④ $\triangle BAE \cong \triangle DCE$	④ AAS \cong AAS
⑤ $\overline{BE} \cong \overline{DE}$	⑤ CPCTC

35) statements	Reasons
① $\overline{RO} \cong \overline{VO}$	① All radii are congruent
② $\overline{PV} \cong \overline{PR}$	② All tangents drawn from the same point are congruent
③ $\overline{PO} \cong \overline{PO}$	③ Reflexive Property
④ $\angle RPO \cong \angle VPO$	④ CPCTC