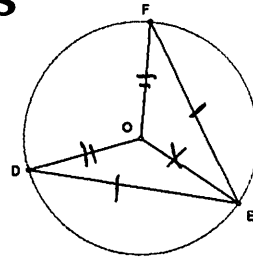


Circle Proofs

1.

Given: In circle O , $\overline{DE} \cong \overline{FE}$

Prove: $\triangle DOE \cong \triangle FOE$

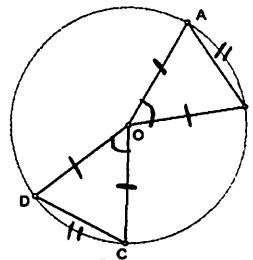


Statements	Reasons
① In circle O $\overline{DE} \cong \overline{FE}$	① Given
② $\overline{OE} \cong \overline{OE}$	② Reflexive Prop.
③ $\overline{FO} \cong \overline{DO}$	③ All radii in a circle are $\cong$
④ $\triangle DOE \cong \triangle FOE$	④ SSS

2.

Given: Circle O with $\widehat{AB} \cong \widehat{CD}$

Prove: $\triangle ABO \cong \triangle CDO$

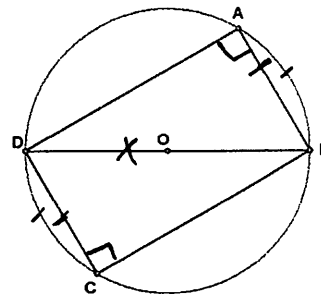


Statements	Reasons
① Circle O w/ $\widehat{AB} \cong \widehat{CD}$	① Given
② $\overline{AO} \cong \overline{CO}$, $\overline{BO} \cong \overline{DO}$	② In a circle all radii are $\cong$
③ $\angle DOC \cong \angle BOA$	③ If central $\angle$'s intercept $\cong$ arcs then those $\angle$'s are $\cong$
④ $\triangle ABO \cong \triangle CDO$	④ SAS

3.

Given: Circle O with $\widehat{AB} \cong \widehat{CD}$

Prove: $AD \cong CB$

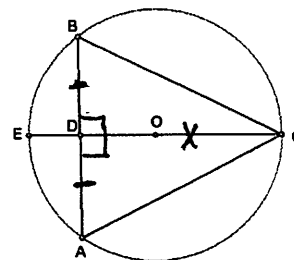


Statements	Reasons
① $\widehat{AB} \cong \widehat{CD}$	① Given
② $\overline{AB} \cong \overline{CD}$	② If chords intercept $\cong$ arcs then those chords are $\cong$
③ $\overline{BD} \cong \overline{BD}$	③ Reflexive Prop.
④ $\angle DAB$ and $\angle DCB$ rt $\angle$'s	④ If inscribed $\angle$'s intercept a semi-circle, those $\angle$'s are right $\angle$'s
⑤ $\angle DAB \cong \angle DCB$	⑤ All right $\angle$'s are $\cong$
⑥ $\triangle DAB \cong \triangle DCB$	⑥ HL
⑦ $\overline{AD} \cong \overline{CB}$	⑦ CPCTC

4.

Given: In circle O , $\overline{EC} \perp \overline{AB}$

Prove: $\triangle ABC$ is isosceles

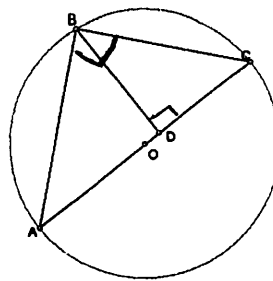


Statements	Reasons
① $\overline{EC} \perp \overline{AB}$	① Given
② $\angle BOC \cong \angle AOC$	② If $\perp$ seg then $2 \cong 90^\circ \angle$'s formed
③ $\overline{BD} \cong \overline{AD}$	③ If a diameter is $\perp$ to a chord then the chord is bisected
④ $\overline{CD} \cong \overline{CD}$	④ Reflexive Prop
⑤ $\triangle BDC \cong \triangle ADC$	⑤ SAS
⑥ $\overline{BC} \cong \overline{AC}$	⑥ CPCTC
⑦ $\triangle ABC$ is isos	⑦ A $\triangle$ w/ $2 \cong$ sides is isos.

5.

Given: Circle O, $\overline{BD} \perp \overline{AC}$

Prove: $\triangle ABC \sim \triangle BDC$

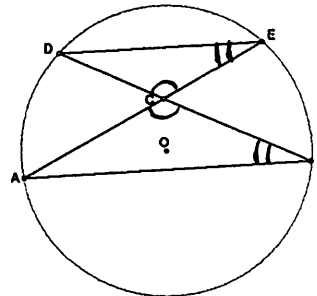


Statements	Reasons
① $\overline{BD} \perp \overline{AC}$	① Given
② $\angle BDC$ is rt. $\angle$	② If 2 segs are $\perp$ then a rt $\angle$ formed
③ $\angle ABC$ is rt. $\angle$	③ If an inscribed $\angle$ intercepts a semicircle then the $\angle$ is a right $\angle$
④ $\angle BDC \cong \angle ABC$	④ All right $\angle$'s are $\cong$
⑤ $\angle C \cong \angle C$	⑤ Reflexive Prop.
⑥ $\triangle ABC \sim \triangle BDC$	⑥ AA~

6.

Given: Circle O

Prove: $(AC)(CE) = (CB)(DC)$



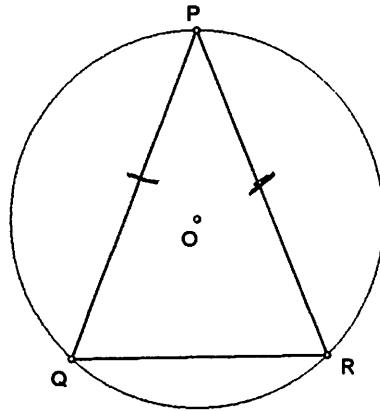
Statements	Reasons
① Circle O	① Given
② $\angle DCE \cong \angle ACB$	② Vertical $\angle$'s are $\cong$
③ $\angle DEC \cong \angle ABC$	③ If 2 inscribed $\angle$'s intercept the same arc then those $\angle$'s are $\cong$
④ $\triangle ABC \sim \triangle DEC$	④ AA~
⑤ $\frac{AC}{CB} = \frac{DC}{CE}$	⑤ Sides of similar $\triangle$'s are in proportion.
⑥ $(AC)(CE) = (CB)(DC)$	⑥ Product of Means = Product of Extremes

7.

Given: ΔPQR is inscribed in circle O

$$\overline{PQ} \cong \overline{PR}$$

Prove: $\widehat{PQR} \cong \widehat{PRQ}$

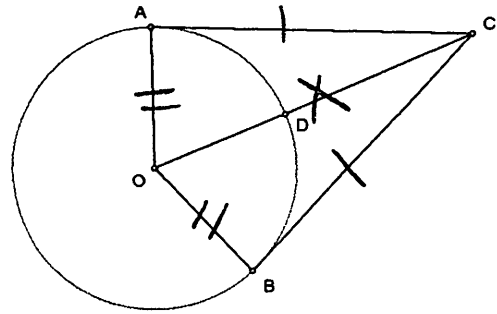


Statements	Reasons
① ΔPQR is inscribed in Circle O	① Given
② $\widehat{PQ} \cong \widehat{PR}$ $\overline{PQ} \cong \overline{PR}$	② If 2 chords are $\cong$ then the arcs the intercept are $\cong$
③ $\widehat{QR} \cong \widehat{QR}$	③ Reflexive Prop.
④ $\widehat{PQ} + \widehat{QR} = \widehat{PR} + \widehat{QR}$	④ Addition Prop of Equality
⑤ $\widehat{PQR} \cong \widehat{PRQ}$	⑤ Arc Addition Postulate

8.

Given: $\overline{AC}$ and $\overline{BC}$ tangent to circle O
at A and B respectively

Prove: $\widehat{AD} \cong \widehat{DB}$



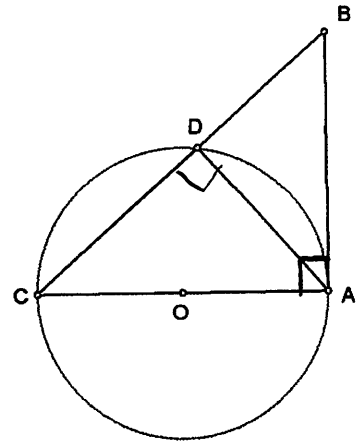
Statements	Reasons
① $\overline{AC}$ and $\overline{BC}$ tangent to Circle O at A and B	① Given
② $\overline{AC} \cong \overline{BC}$	② If tangents are drawn to an external point then they are $\cong$
③ $\overline{AO} \cong \overline{BO}$	③ In a circle all radii are $\cong$
④ $\overline{CO} \cong \overline{CO}$	④ Reflexive Prop.
⑤ $\triangle AOC \cong \triangle BOC$	⑤ SSS
⑥ $\angle AOD \cong \angle BOD$	⑥ CPCTC
⑦ $\widehat{AD} \cong \widehat{DB}$	⑦ If 2 central $\angle$ s are $\cong$ then the arcs they intercept are $\cong$

9.

Given: Tangent $\overline{AB}$ and secant $\overline{BDC}$ intersect at B outside circle O

$\overline{AOC}$ is a diameter, $\overline{AD}$ is a chord

Prove: $\triangle ABC \sim \triangle DAC$

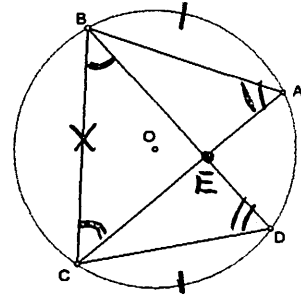


Statements	Reasons
① Tangent $\overline{AB}$, Secant $\overline{BDC}$ intersect at B $\overline{AOC}$ is diameter $\overline{AD}$ is chord	① Given
② $\angle CAB$ is right $\angle$	② If a radius is drawn to a tangent then the radius and tangent form a right $\angle$
③ $\angle CDA$ is a right $\angle$	③ If an inscribed $\angle$ intercepts a semicircle the angle is a right $\angle$
④ $\angle CAB \cong \angle CDA$	④ All right $\angle$'s are $\cong$
⑤ $\angle C \cong \angle C$	⑤ Reflexive Prop
⑥ $\triangle ABC \sim \triangle DAC$	⑥ AA $\sim$

10.

Given: Chords $\overline{AC}$ and $\overline{BD}$ of circle O intersect at E
 $\widehat{AB} \cong \widehat{CD}$

Prove: $\triangle ABC \cong \triangle DCB$

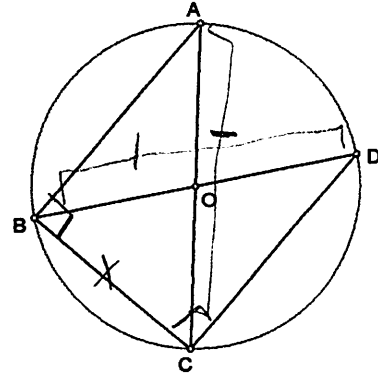


Statements	Reasons
① $\widehat{AB} \cong \widehat{CD}$	① Given
② $\overline{BC} \cong \overline{BC}$	② Reflexive Prop
③ $\angle DBC \cong \angle ACB$	③ If 2 inscribed $\angle$'s intercept $\cong$ arcs then those $\angle$'s are $\cong$
④ $\angle BDC \cong \angle CAB$	④ If inscribed $\angle$'s intercept the same arc then those $\angle$'s are $\cong$
⑤ $\triangle ABC \cong \triangle DCB$	⑤ AAS

11.

Given: Diameters $\overline{AC}$ and $\overline{BD}$ intersect at O

Prove: $\triangle ABC \cong \triangle DCB$

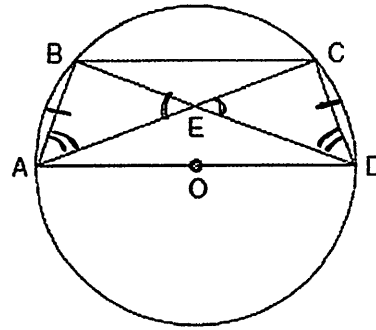


Statements	Reasons
① Diameters $\overline{AC}$ and $\overline{BD}$	① Given
② $\overline{BC} \cong \overline{CB}$	② Reflexive Prop
③ $\overline{AC} \cong \overline{DB}$	③ In a circle all diameters are $\cong$
④ $\angle ABC$ and $\angle DCB$ are right $\angle$'s	④ If inscribed $\angle$'s intercept a semicircle then those $\angle$'s are right $\angle$'s
⑤ $\angle ABC \cong \angle DCB$	⑤ All right $\angle$'s are $\cong$
⑥ $\triangle ABC \cong \triangle DCB$	⑥ HL

12.

Given: $\overline{AD} \parallel \overline{BC}$

Prove: $\overline{BE} \cong \overline{CE}$

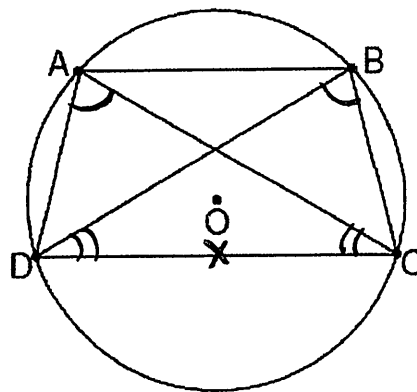


Statements	Reasons
① $\overline{AD} \parallel \overline{BC}$	① Given
② $\angle BEA \cong \angle CED$	② Vertical $\angle$'s are $\cong$
③ $\widehat{AB} \cong \widehat{CD}$	③ If segments are $\parallel$ in a circle then the arcs they intercept are $\cong$
④ $\overline{AB} \cong \overline{CD}$	④ If chords intercept $\cong$ arcs then those chords are $\cong$
⑤ $\angle BAC \cong \angle CDB$	⑤ If inscribed $\angle$'s intercept the same arc then those $\angle$'s are $\cong$
⑥ $\triangle ABE \cong \triangle DCE$	⑥ AAS
⑦ $\overline{BE} \cong \overline{CE}$	⑦ CPCTC

13.

Given: $\overline{AB} \parallel \overline{DC}$

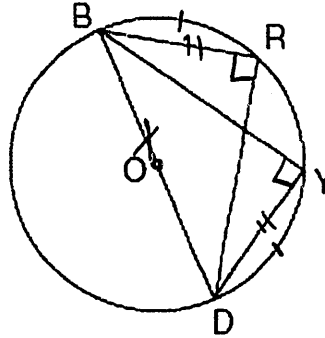
Prove: $\triangle ACD \cong \triangle BDC$



Statements	Reasons
① $\overline{AB} \parallel \overline{DC}$	① Given
② $\overline{DC} \cong \overline{DC}$	② Reflexive Prop
③ $\angle DBC \cong \angle CAD$	③ If inscribed $\angle$'s intercept the same arc then those $\angle$'s are $\cong$
④ $\widehat{AD} \cong \widehat{BC}$	④ If segments are $\parallel$ in a circle then the arcs they intercept are $\cong$
⑤ $\angle ACD \cong \angle BDC$	⑤ If inscribed $\angle$'s intercept $\cong$ arcs then those $\angle$'s are $\cong$
⑥ $\triangle ACD \cong \triangle BDC$	⑥ AAS

14.

Given: $\widehat{BR} \cong \widehat{YD}$
 Prove: $\triangle RBD \cong \triangle YBD$



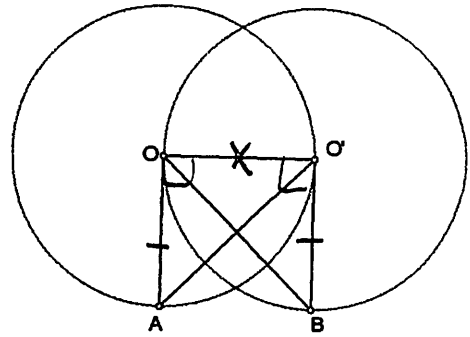
Statements	Reasons
① $\widehat{BR} \cong \widehat{YD}$	① Given
② $\overline{BR} \cong \overline{YD}$	② If chords intercept $\cong$ arcs then the chords are $\cong$
③ $\overline{BD} \cong \overline{BD}$	③ Reflexive Prop.
④ $\angle BRD$ and $\angle BYD$ are right $\angle$'s	④ If inscribed $\angle$'s intercept a Semi-circle the $\angle$'s are right $\angle$'s
⑤ $\angle BRD \cong \angle BYD$	⑤ All right $\angle$'s are $\cong$
⑥ $\triangle RBD \cong \triangle YBD$	⑥ HL

15.

Given: O' on circle O , and O on circle O'

$$\overline{OA} \perp \overline{OO'} \text{ and } \overline{OB} \perp \overline{OO'}$$

Prove: $\overline{AO'} \cong \overline{BO}$



Statements	Reasons
① $\overline{OA} \perp \overline{OO'}$ · $\overline{OB} \perp \overline{OO'}$	① Given
② $\overline{OO'} \cong \overline{OO'}$	② Reflexive Prop
③ $\overline{AO} \cong \overline{O'O}$ $\overline{BO'} \cong \overline{OO'}$	③ All radii in a circle are $\cong$
④ $\overline{AO} \cong \overline{BO'}$	④ Transitive Property
⑤ $\angle AOO' \cong \angle BO'O$	⑤ If seg are $\perp$ then $2 \cong 90^\circ$ $\angle$'s are formed.
⑥ $\triangle AOO' \cong \triangle BO'O$	⑥ SAS
⑦ $\overline{AO'} \cong \overline{BO}$	⑦ CPCTC