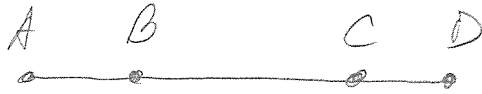


Common Segment Thm

(A)



Given: $\overline{AB} \cong \overline{CD}$

Prove: $\overline{AC} \cong \overline{BD}$

$$\begin{aligned} \textcircled{1} \overline{AB} \cong \overline{CD} &\rightarrow \textcircled{2} AB = CD \rightarrow \textcircled{3} AB + BC = CD + BC \\ &\left. \begin{array}{l} \textcircled{4} AB + BC = AC \\ BC + CD = BD \end{array} \right\} \rightarrow \textcircled{5} AC = BD \end{aligned}$$

① Given

② \cong segmts have = measures

③ Addition Prop.

④ Segment Add. Prop.

⑤ Substitution

⑥ \cong segmts have = measures.

⑥ $\overline{AC} \cong \overline{BD}$

(B)

Given: $\overline{AC} \cong \overline{BD}$

Prove: $\overline{AB} \cong \overline{CD}$



$$\begin{aligned} \textcircled{1} \overline{AC} \cong \overline{BD} &\rightarrow \textcircled{2} AC = BD \\ &\left. \begin{array}{l} \textcircled{3} AB + BC = AC \\ BC + CD = BD \end{array} \right\} \rightarrow \textcircled{4} AB + BC = BC + CD \rightarrow \textcircled{5} AB = CD \\ &\rightarrow \textcircled{6} \overline{AB} \cong \overline{CD} \end{aligned}$$

① Given

② \cong segmts have = measures.

③ Segment Add. Post.

④ Substitution Prop.

⑤ Subtraction Prop.

⑥ \cong segmts have = measures.

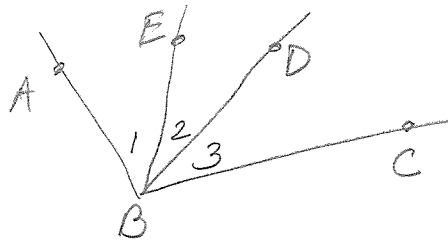


Common Angle Thm

"Subtracted from"

(A) Given: $\angle ABD \cong \angle EBC$

Prove: $\angle 1 \cong \angle 3$

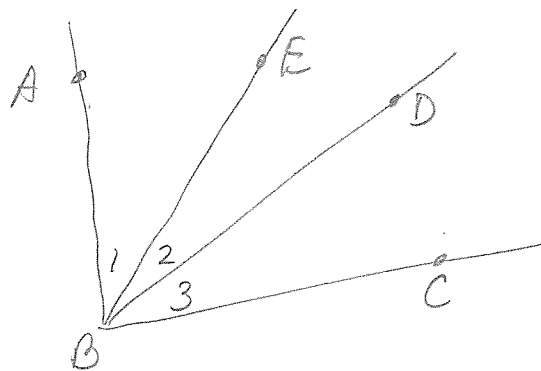


$$\begin{aligned} \textcircled{1} \angle ABD \cong \angle EBC &\rightarrow \textcircled{2} m\angle ABD = m\angle EBC \\ \left. \begin{aligned} \textcircled{3} m\angle 1 + m\angle 2 &= m\angle ABD \\ m\angle 3 + m\angle 2 &= m\angle EBC \end{aligned} \right\} &\rightarrow \textcircled{4} m\angle 1 + m\angle 2 = m\angle 2 + m\angle 3 \end{aligned}$$

$$\textcircled{5} m\angle 1 = m\angle 3 \rightarrow \textcircled{6} \angle 1 \cong \angle 3$$

- ① Given
- ② $\cong \angle$ s have = measures
- ③ Angle addition Postulate
- ④ Substitution Prop.
- ⑤ Subtraction Prop.
- ⑥ $\cong \angle$ s have = measures.

- ① Given: $\angle 1 \cong \angle 3$
Prove: $\triangle ABD \cong \triangle EBC$



- ① $\angle 1 \cong \angle 3 \rightarrow$ ② $m\angle 1 = m\angle 3 \rightarrow$ ③ $m\angle 1 + m\angle 2 = m\angle 3 + m\angle 2$
④ $m\angle 1 + m\angle 2 = m\angle ABD$
 $m\angle 2 + m\angle 3 = m\angle EBC$

- ⑤ $m\angle ABD = m\angle EBC \rightarrow$ ⑥ $\triangle ABD \cong \triangle EBC$

- ① Given
② $\cong \angle$ s have = measures.
③ Addition Prop.
④ Angle Add. Post.
⑤ Substitution Prop.
⑥ $\cong \angle$ s have equal measures.