

How to Plan and Write a Proof



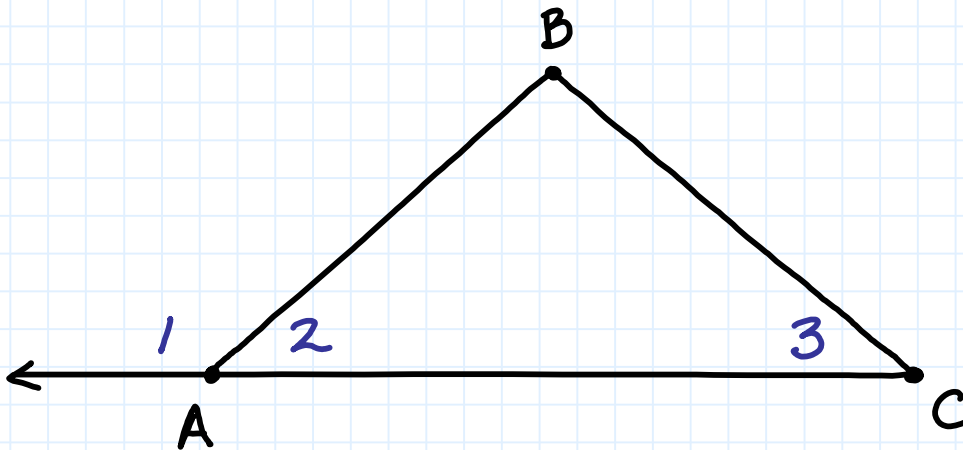
Overview of problems



Example Set: A

Given $m\angle 1 + m\angle 3 = 180$

Prove: $m\angle 2 = m\angle 3$



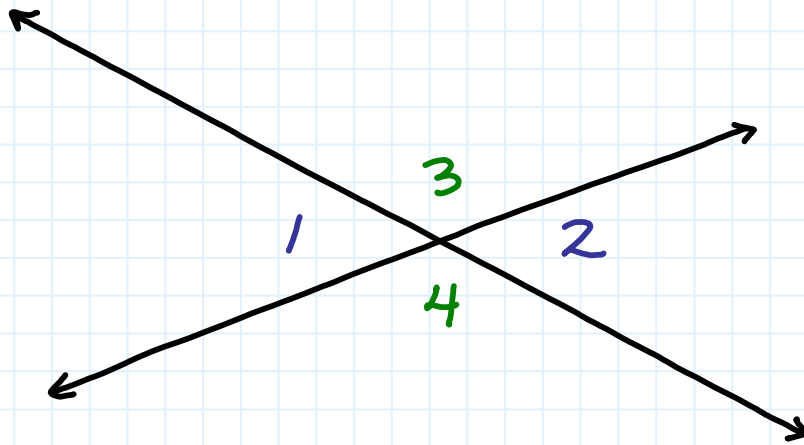


Example Set: B

Prove the vertical angle theorem

Given: $\angle 1$ and $\angle 2$ are vertical angles

Prove: $\angle 1 \cong \angle 2$

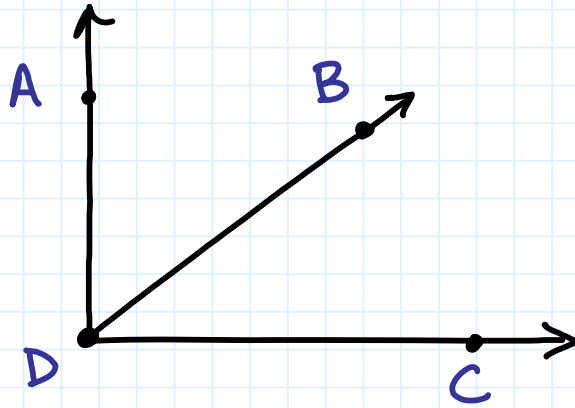




Example Set: C

Given: $\overrightarrow{DA} \perp \overrightarrow{DC}$

Prove: $\angle ADB$ and $\angle BDC$ are complementary angles



How to Plan and Write a Proof



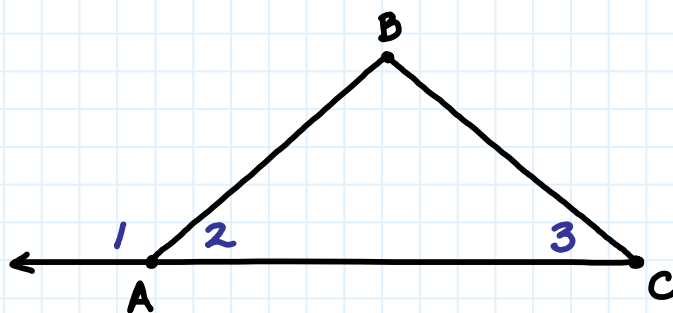
Overview of problems- KEY



Example Set: A

Given $m\angle 1 + m\angle 3 = 180$

Prove: $m\angle 2 = m\angle 3$



| Statement | Reason |
|--|----------------------|
| $\angle 1 + \angle 3 = 180^\circ$ | Given |
| $\angle 1 + \angle 2 = 180^\circ$ | Angle Addition Post. |
| $\angle 1 + \angle 3 =$ $\angle 1 + \angle 2$ | Substitution Prop. |
| $\angle 1 = \angle 1$ | Reflexive Prop. |
| $\angle 3 = \angle 2$ | Substitution Prop. |

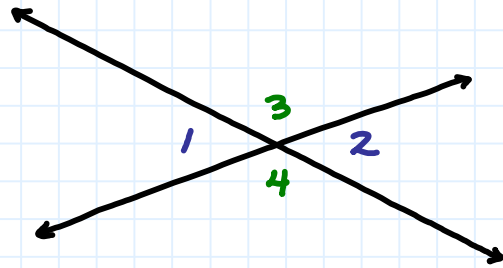


Example Set: B

Prove the vertical angle theorem

Given: $\angle 1$ and $\angle 2$ are vertical angles

Prove: $\angle 1 \cong \angle 2$



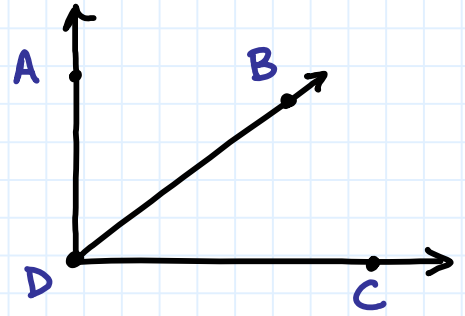
| Statement | Reason |
|--|----------------------|
| $\angle 1$ and $\angle 2$ are vertical angles | Given |
| $\angle 1 + \angle 3 \cong 180$ $\angle 3 + \angle 2 \cong 180$ | Angle Addition Post. |
| $\angle 1 + \angle 3 \cong \angle 3 + \angle 2$ | Substitution Prop. |
| $\angle 3 \cong \angle 3$ | Reflexive Prop. |
| $\angle 1 \cong \angle 2$ | Subtraction Prop. |



Example Set: C

Given: $\vec{DA} \perp \vec{DC}$

Prove: $\angle ADB$ and $\angle BDC$ are complementary angles



| Statement | Reason |
|--|------------------------------|
| $\vec{DA} \perp \vec{DC}$ | Given |
| $m\angle ADC = 90^\circ$ | Def. of \perp lines |
| $m\angle ADB + m\angle BDC = m\angle ADC$ | Angle Addition Post. |
| $m\angle ADB + m\angle BDC = 90^\circ$ | Substitution Prop. |
| $\angle ADB$ and $\angle BDC$ are complementary angles | Def. of Complementary angles |