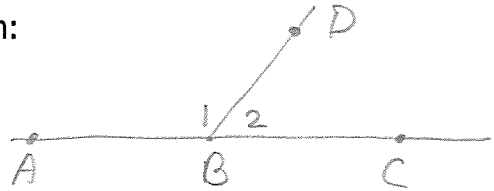


Definition of linear pair: 2 \angle s that are adjacent and opp. sides are opp. rays

Linear pair Theorem: If two angles form a linear pair, then they are supplementary angles. (short version: A linear pair are supplementary.)

Given: $\angle 1$ and $\angle 2$ form a linear pair. Diagram:



Prove: $\angle 1$ supp $\angle 2$

① $\angle 1$ and $\angle 2$ lin. pr. \rightarrow ② \vec{BA} & \vec{BC} opp rays \rightarrow ③ $\angle ABC$ is straight \angle

④ $m\angle ABC = 180$ \rightarrow ⑤ $m\angle 1 + m\angle 2 = m\angle ABC$ \rightarrow ⑥ $m\angle 1 + m\angle 2 = 180$ \rightarrow ⑦ $\angle 1$ supp $\angle 2$

① Given

② Def. of linear pair.

③ A straight \angle consists of opposite rays and measure 180° .

④ same as #3

⑤ Angle Add. Post.

⑥ Substitution Prop.

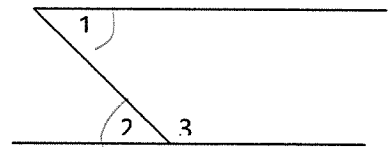
⑦ Supplem. \angle s total 180° .

Example 1:

Given: $\angle 1 \cong \angle 2$

Prove: $\angle 1$ supplements $\angle 3$

Diagram:



① $\angle 2$ & $\angle 3$ lin. pair. \rightarrow ② $\angle 2$ supp $\angle 3$ \rightarrow ③ $m\angle 2 + m\angle 3 = 180$ \rightarrow ④ $\angle 1 \cong \angle 2$ \rightarrow ⑤ $m\angle 1 = m\angle 2$ \rightarrow ⑥ $m\angle 1 + m\angle 3 = 180$

⑦ $\angle 1$ supplements $\angle 3$.

① Def. of linear pair

② linear pair is supplementary.

③ Supplementary \angle s total 180° .

④ Given

⑤ \cong \angle s have equal measures.

⑥ Substitution Prop.

⑦ Supplementary \angle s total 180° .

definition of complementary angles: 2 angles whose measures total 90° .

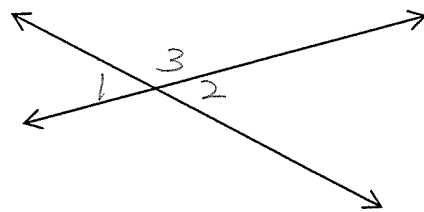
definition of supplementary angles:- 2 angles whose measures total 180° .

vertical angles: 2 angles such that the sides of one angle are opposite rays to the sides of the other angle.

Vertical Angle Theorem: Vertical angles are congruent.

Given: $\angle 1$ & $\angle 2$ are vertical \angle s. Diagram:

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



① $\angle 1$ & $\angle 3$ linear pair. \rightarrow ② $\angle 1$ & $\angle 3$ supplement \rightarrow ③ $m\angle 1 + m\angle 3 = 180$
 $\angle 2$ & $\angle 3$ linear pair. \rightarrow $\angle 2$ & $\angle 3$ supplement. $\rightarrow m\angle 2 + m\angle 3 = 180$

④ $m\angle 1 + m\angle 3 = m\angle 2 + m\angle 3 \rightarrow$ ⑤ $m\angle 1 = m\angle 2 \rightarrow$ ⑥ $\angle 1 \cong \angle 2$

① Def. of a linear pair.

② Linear pair is supplementary.

③ Supplementary \angle s total 180° .

④ Substitution Prop.

⑤ Subtraction Prop.

⑥ \cong angles have equal measures.