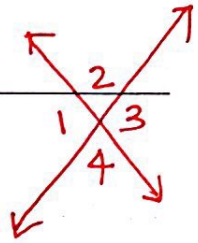
H.Geometry – Chapter 2 – Definition Sheet

Section 2.5

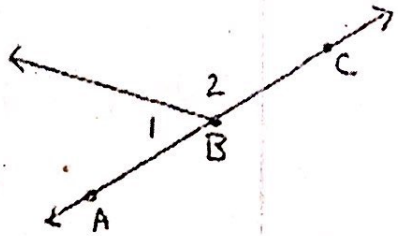
Linear Pair	Adjacent Angles whose non-common sides form a straight line. Conjecture: ∠1 and ∠2 are supplementary 
Vertical Angles	Non-Adjacent angles formed by the intersection of two lines. Conjecture: ∠1 and ∠3 are congruent

PROVE IT:

PROOF: LINEAR PAIRS ARE SUPPLEMENTARY

GIVEN: ∠1 AND ∠2 ARE A LINEAR PAIR

PROVE: ∠1 AND ∠2 ARE SUPPLEMENTARY



CONCLUSIONS	JUSTIFICATIONS
0. ∠1 AND ∠2 ARE LINEAR PAIR	0. GIVEN
1. $m\angle 1 + m\angle 2 = m\angle ABC$	1. SAP
2. $m\angle ABC = 180°$	2. Defn. of straight line.
3. $m\angle 1 + m\angle 2 = 180°$	3. Substitution
4. ∠1 and ∠2 are supplementary	4. Defn. of supp. ∠'s

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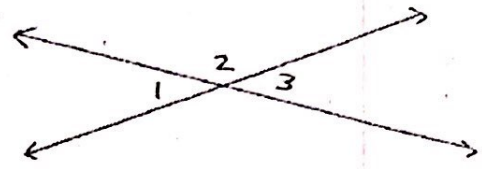
PROOF: VERTICAL ANGLES ARE CONGRUENT

GIVEN: $\angle 1$ AND $\angle 3$ ARE VERTICAL ANGLES

PROVE: $\angle 1 \cong \angle 3$



CONCLUSIONS	JUSTIFICATIONS
0. $\angle 1$ AND $\angle 3$ ARE VERTICAL $\angle$'S	0. GIVEN
1. $\angle 1$ and $\angle 2$ are supple. $\angle 2$ and $\angle 3$ are supple.	1. Linear Pair theorem
2. $m\angle 1 + m\angle 2 = 180°$ $m\angle 2 + m\angle 3 = 180°$	2. Defn. of supplementary angles
3. $m\angle 1 + m\angle 2 = m\angle 2 + m\angle 3$	3. Substitution/Transitive
4. $m\angle 2 = m\angle 2$	4. Reflexive
5. $m\angle 1 = m\angle 3$	5. Addition prop. of $=$
6. $\angle 1 \cong \angle 3$	6. Defn. of $\cong$ angles

Linear Pair Theorem	If two angles form a Linear Pair, then they are supplementary. NOTE: To say the angles add up to 180°, you need an additional step (using the definition of supplementary).
Vertical Angle Theorem	If two angles are vertical angles, then they are congruent. NOTE: To say the angles are equal measures, you need an additional step (using the definition of congruent angles).

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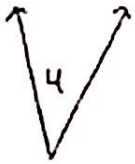
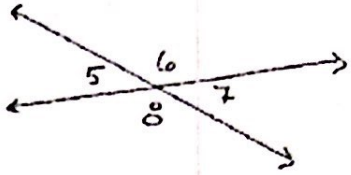
Examples:

GIVEN: $\angle 4 \cong \angle 5$

PROVE: $\angle 4 \cong \angle 7$

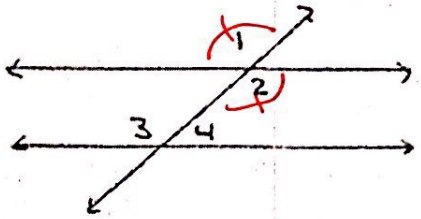




CONCLUSIONS	JUSTIFICATIONS
0. $\angle 4 \cong \angle 5$	0. Given
1. $\angle 5 \cong \angle 7$	1. Vertical Angle Theorem
2. $\angle 4 \cong \angle 7$	2. Transitive prop. of $\cong$

GIVEN: $m\angle 1 = m\angle 3$

PROVE: $\angle 2$ AND $\angle 4$ ARE SUPPLEMENTARY



CONCLUSIONS	JUSTIFICATIONS
0. $m\angle 1 = m\angle 3$	0. given
1. ~~$\angle 1$~~ $\angle 1 \cong \angle 2$	1. vertical angle thm
2. $m\angle 1 = m\angle 2$	2. Defn. of $\cong$ $\angle$'s
3. $m\angle 2 = m\angle 3$	3. Transitive
4. $\angle 3$ and $\angle 4$ are supp.	4. Linear Pair Theorem
5. $m\angle 3 + m\angle 4 = 180$	5. Defn. of supp.
6. $m\angle 2 + m\angle 4 = 180$	6. Substitution
7. $\angle 2$ and $\angle 4$ are supp.	7. Defn. of supp. $\angle$s