

I. Writing Justification

Example: Write a justification for each step, given that  $\angle A$  and  $\angle B$  are complementary and  $\angle A \cong \angle C$ .

<u>Statement</u>	<u>Justification</u>
1. $\angle A$ and $\angle B$ are complementary	1. Given
2. $m\angle A + m\angle B = 90^\circ$	2. Def of comp angles
3. $\angle A \cong \angle C$	3. Given
4. $m\angle A = m\angle C$	4. Def of cong. angles
5. $m\angle C + m\angle B = 90^\circ$	5. Substitution prop of eq.
6. $\angle C$ and $\angle B$ are complementary.	6. Def of comp angles

II. What is a theorem?

A **theorem** is any statement that you can prove. Once a theorem is proved, you can use it in proofs.

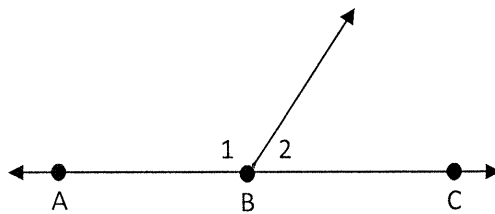
Theorem	Hypothesis	Conclusion
<p style="text-align: center;"><b>Linear Pair Theorem</b></p> <p>If two angles form a linear pair, then they are supplementary</p>	$\angle A$ and $\angle B$ are a linear pair.	$\angle A$ and $\angle B$ are supplementary.
<p style="text-align: center;"><b>Congruent Supplements Theorem</b></p> <p>If two angles are supplementary to the same angle (or to two congruent angles), then the two angles are congruent.</p>	$\angle 1$ and $\angle 2$ are supplementary. $\angle 2$ and $\angle 3$ are supplementary.	$\angle 1 \cong \angle 3$
<p style="text-align: center;"><b>Right Angle Congruence Theorem</b></p> <p>All right angles are congruent.</p>	$\angle A$ and $\angle B$ are right angles.	$\angle A \cong \angle B$
<p style="text-align: center;"><b>Congruent Complements Theorem</b></p> <p>If two angles are complementary to the same angle (or to two congruent angles), then the two angles are congruent.</p>	$\angle 1$ and $\angle 2$ are complementary. $\angle 2$ and $\angle 3$ are complementary.	$\angle 1 \cong \angle 3$

### III. Proving Theorems (TWO-COLUMN PROOFS)

Example:

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

Prove:  $\angle 1$  and  $\angle 2$  are supplementary.



not essential \*

- | Statements  | Justifications                    |
|---|-----------------------------------|
| 1. $\angle 1$ and $\angle 2$ form a linear pair                           | 1. Given                          |
| <del>2. <math>\vec{BA}</math> and <math>\vec{BC}</math> form a line</del> | <del>2. Def. of linear pair</del> |
| 3. $m\angle ABC = 180^\circ$  | 3. Def. of a straight angle       |
| 4. $m\angle 1 + m\angle 2 = m\angle ABC$                                  | 4. Angle Add. Postulate           |
| 5. $m\angle 1 + m\angle 2 = 180^\circ$                                    | 5. Substitution prop. of equality |
| 6. $\angle 1$ and $\angle 2$ are supp.                                    | 6. Def of supp. angles.           |

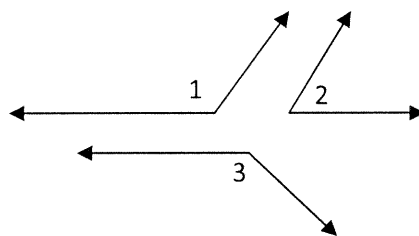


Example:

Given:  $\angle 1$  and  $\angle 2$  are supplementary.

$\angle 2$  and  $\angle 3$  are supplementary.

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

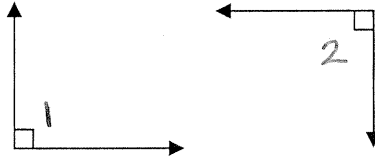


- | Statements   | Justifications               |
|--|------------------------------|
| 1. $\angle 1$ and $\angle 2$ are supp. angles      | 1. Given                     |
| 2. $\angle 2$ and $\angle 3$ are supp. angles      | 2. Given                     |
| 3. $m\angle 1 + m\angle 2 = 180^\circ$             | 3. Def of supp angles        |
| 4. $m\angle 2 + m\angle 3 = 180^\circ$             | 4. Def of supp angles        |
| 5. $m\angle 1 + m\angle 2 = m\angle 2 + m\angle 3$ | 5. Substitution prop. of eq. |
| 6. $m\angle 1 = m\angle 3$                         | 6. Sub. Prop of Eq.          |
| 7. $\angle 1 \cong \angle 3$                       | 7. Def of cong. angles       |

Example:

Given:  $\angle 1$  and  $\angle 2$  are right angles.

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



Statements	Justifications
1. $\angle 1$ and $\angle 2$ are rt. angles	1. Given
2. $m\angle 1 = 90^\circ$	2. Def of rt angle
3. $m\angle 2 = 90^\circ$	3. Def of rt angle
4. $m\angle 1 = m\angle 2$	4. substitution prop. of eq.
5. $\angle 1 \cong \angle 2$	5. Def of cong angles.