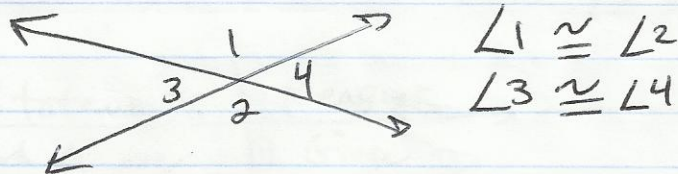


## 2-5 Proving Angles Congruent

### Vertical Angles Theorem

Vertical angles are congruent



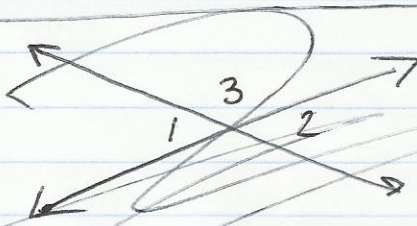
### Congruent Supplements Theorem

If two angles are supplements of the same angle, or of congruent angles, then the two angles are congruent.

### Congruent Complements Theorem

If two angles are complements of the same angle, or of congruent angles, then the two angles are congruent.

Proving a theorem:



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

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

Statements      Reasons

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

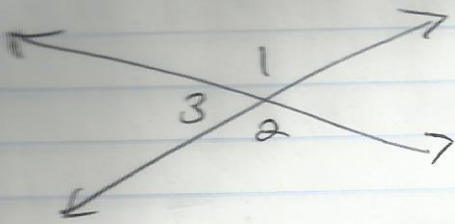
②  $m\angle 1 + m\angle 3 = 180$   
 $m\angle 2 + m\angle 3 = 180$       ② Angle Add. Postulate

③



## Proving a Theorem:

Proof of vertical angles theorem:



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

Prove  $\angle 1 \cong \angle 2$

Statements	Reasons
① $\angle 1$ and $\angle 2$ are vertical $\angle$ s.	① Given
② $m\angle 1 + m\angle 3 = 180$ $m\angle 2 + m\angle 3 = 180$	② Angle Addition Postulate
③ $m\angle 1 + m\angle 3 = m\angle 2 + m\angle 3$	③ Substitution
④ $m\angle 1 = m\angle 2$	④ Subtraction Prop. of Equal.
⑤ $\angle 1 \cong \angle 2$	⑤ Definition of $\cong$ .

2-column proof

\* See textbook for proof of Congruent Supplements Theorem (pg. 112) in "paragraph proof" form.