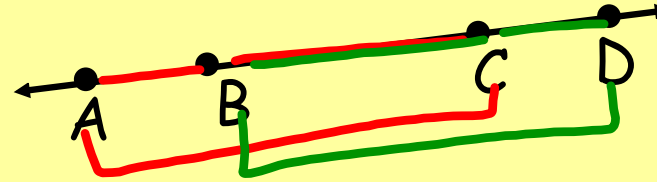


10/2/19 - Warm Up Problem

Given: $AB = CD$

Prove: $AC = BD$



Statements	Justifications
1. $AB = CD$	given
2. $AB + BC = AC$	Segment Add postulate
3. $CD + BC = BD$	segment add postulate
4. $AB + BC = BD$	substitution
5. $AC = BD$	transitive of equality

Concept 6 Worksheet #2 (1-5)

PROOFS USING POSTULATES AND DEFINITIONS

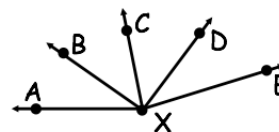
Complete each 2-column proof.

1. Given: $\overline{CD} \cong \overline{EF}$
 $\overline{DE} \cong \overline{FG}$
 Prove: $\overline{CE} \cong \overline{EG}$



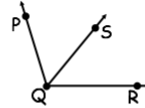
Statements	Justifications
1. $\overline{CD} \cong \overline{EF}$	
2. $\overline{DE} \cong \overline{FG}$	
3. $CD = EF$	
4. $DE = FG$	
5. $CD + DE = CE$	
6. $EF + FG = EG$	
7. $CD + FG = EG$	Substitution Prop
8. $CD + DE = EG$	Substitution Prop
9. $CE = EG$	Transitive Prop of =
10. $\overline{CE} \cong \overline{EG}$	Def. of congruent

2. Given: \overline{XB} bisects $\angle AXC$.
 \overline{XD} bisects $\angle CXE$
 Prove: $m\angle DXE + m\angle AXB = m\angle BXD$



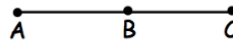
Statements	Justifications
1. \overline{XB} bisects $\angle AXC$.	
2. \overline{XD} bisects $\angle CXE$	
3. $m\angle AXB = m\angle BXC$	
4. $m\angle CXD = m\angle DXE$	
5. $m\angle CXD + m\angle BXC = m\angle BXD$	
6. $m\angle DXE + m\angle BXC = m\angle BXD$	
7. $m\angle DXE + m\angle AXB = m\angle BXD$	

3. Given: \overline{QS} is an angle bisector of $\angle PQR$.
 Prove: $m\angle PQS = \frac{1}{2}m\angle PQR$



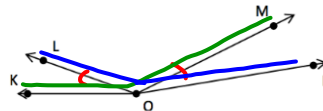
Statements	Justifications
1. \overline{QS} is an angle bisector of $\angle PQR$.	
2. $\angle PQS \cong \angle SQR$	
3. $m\angle PQS = m\angle SQR$	
4. $m\angle PQS + m\angle SQR = m\angle PQR$	
5. $m\angle PQS + m\angle PQS = m\angle PQR$	
6. $2 \cdot m\angle PQS = m\angle PQR$	
7. $m\angle PQS = \frac{1}{2}m\angle PQR$	

4. Given: $2AB = AC$
 Prove: $AB = BC$



Statements	Justifications
1. $2AB = AC$	Given
2. $AB + BC = AC$	Segment Add. Post.
3. $2AB = AB + BC$	Transitive Prop. of =
4. $AB = BC$	Subtraction Prop.
5.	
6.	

5. Given: $m\angle KOL = m\angle MON$
 Prove: $m\angle KOM = m\angle LON$



Statements	Justifications
1. $m\angle KOL = m\angle MON$	Given
2. $m\angle KOL + m\angle LOM = m\angle KOM$	Angle Add. Post.
3. $m\angle LOM + m\angle MON = m\angle LON$	Angle Add. Post.
4. $m\angle LOM + m\angle KOL = m\angle LON$	Substitution Prop.
5. $m\angle KOM = m\angle LON$	Transitive Prop. of =
6.	

Section 2.6 - Proving Angles Congruent

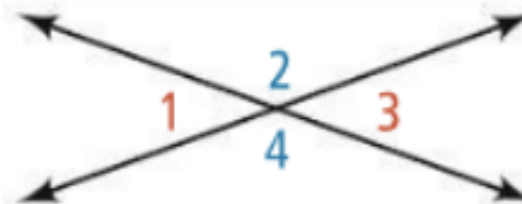
Goals: Prove and apply theorems about angles

Postulate: an accepted statement of fact

Theorem: a **proven** statement of fact

Vertical Angles Theorem

Vertical angles are congruent.

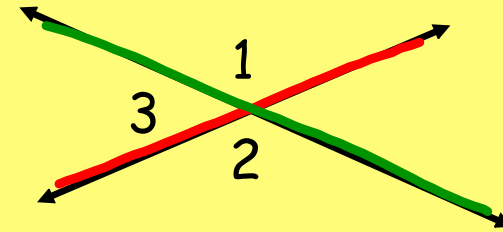


- Theorems are used like postulates in proofs to introduce new equations when the given information is not enough

Proving the Vertical Angles Theorem

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

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

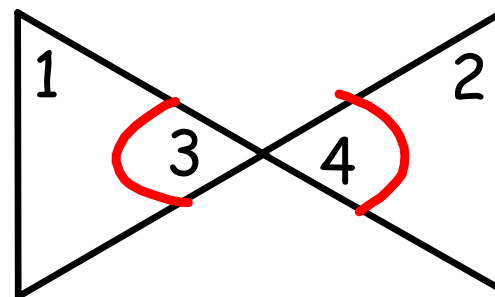


Statements	Justifications
1. $\angle 1$ and $\angle 2$ are vertical	Given
2. $m\angle 1 + m\angle 3 = 180$	Linear Pair Postulate
3. $m\angle 2 + m\angle 3 = 180$	Linear Pair Postulate
4. $m\angle 1 + \underline{m\angle 3} = m\angle 2 + \underline{m\angle 3}$	Transitive Prop. of = (2,3)
5. $m\angle 1 = m\angle 2$	Subtraction Prop.
6. $\angle 1 \cong \angle 2$	Def. of Congruent

Using the Vertical Angles Theorem

Given: $\angle 1 \cong \angle 3$, $\angle 2 \cong \angle 4$

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



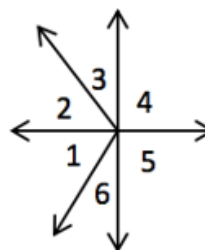
Statements	Justifications
1. $\underline{\angle 1} \cong \underline{\angle 3}$	Given
2. $\underline{\angle 2} \cong \underline{\angle 4}$	Given
3. $\underline{\angle 3} \cong \underline{\angle 4}$	Vertical Angles Theorem
4. $\underline{\angle 1} \cong \underline{\angle 4}$	Transitive Property of \cong (1,3)
5. $\angle 1 \cong \angle 2$	Transitive Property of \cong (2,4)

Assignment:

Concept 6 Worksheet #2 - due by Monday 10/7 (start on 6-10)

PROOFS USING ANGLE RELATIONSHIPS AND THEOREMS

6. **Given:** $\angle 4$ is a right angle
 $\angle 1 \cong \angle 2$
Prove: $\angle 2$ and $\angle 6$ are complementary



Statements	Justifications
1. $\angle 4$ is a right angle	
2. $\angle 1 \cong \angle 2$	
3. $m\angle 4 = 90$	
4. $m\angle 1 = m\angle 2$	
5. $m\angle 1 + m\angle 6 = m\angle 4$	
6. $m\angle 1 + m\angle 6 = 90$	
7. $m\angle 2 + m\angle 6 = 90$	
8. $\angle 2$ and $\angle 6$ are complementary	