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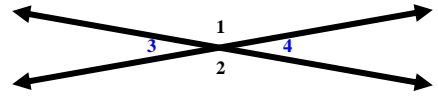
Class: Honors Geometry

Date: 9/14/06

Topic: Lesson 2-5 (Proving Angles Congruent)

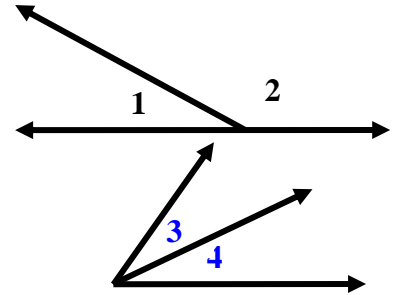
Vertical \angle 's

2 \angle 's whose sides form 2 pairs of opposite rays.



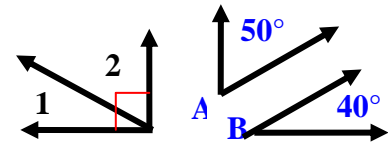
Adjacent \angle 's

2 coplanar \angle 's with:
1. a common side
2. a common vertex
3. no common interior pts



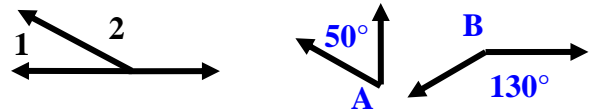
Complementary \angle 's

2 \angle 's, sum of measures is 90
Do not have to share common side or vertex
One is the complement of the other.



Supplementary \angle 's

2 \angle 's, sum of measures is 180
Do not have to share common side or vertex
One is the supplement of the other.



Drawing conclusions from diagrams

Can:
1. adjacent \angle 's
2. adjacent supplementary \angle 's
3. vertical \angle 's

Can not unless have special markings or info:
1. congruent \angle 's or segments (marked)
2. right \angle 's (marked \square or measured)
3. non-adjacent supplementary \angle 's (marked or measured)
4. parallel lines (matching arrow head marks mid-line)
5. perpendicular lines (\perp symbol)

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Example

Pg 97 Example 2
<optional, as needed>

Example

Pg 97 Check Understanding 2
<optional, as needed>

Proving
 \angle 's congruent

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

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

Proof: $m\angle 1 + m\angle 3 = 180$

$m\angle 2 + m\angle 3 = 180$

$m\angle 1 + m\angle 3 = m\angle 2 + m\angle 3$

$m\angle 1 = m\angle 2$

$\angle 1 \cong \angle 2$

Angle Addition Post

“” “” “”

Subst Prop (1 side)

Subtr Prop = (-m $\angle 3$)

Defn Congruent \angle 's

Q.E.D.

“Which was demonstrated”

Latin: Quod Erat Demonstrandum

What is a theorem?

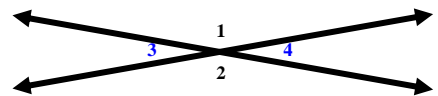
A proven conjecture

Theorem 2-1

Vertical Angles Theorem

Vertical \angle 's are congruent

$\angle 1 \cong \angle 2$ and $\angle 3 \cong \angle 4$



Using Theorem 2-1

Pg 99, Check Understanding 4

Solve for x and justify each step.

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

$m\angle 1 = m\angle 2$ **Defn congruent angles**

$4x = 3x + 35$ **Substitution Prop (all on one side)**

$x = 35$ **Subtraction Prop = (-3x each side)**

$\therefore m\angle 1 = m\angle 2 = 140$

$m\angle 3 = m\angle 4 = 180 - 140 = 40$

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Proving supplements
are congruent

Given: $\angle 1$ and $\angle 2$ are supplementary
 $\angle 2$ and $\angle 3$ are supplementary

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

Proof:

$$m\angle 1 + m\angle 2 = 180$$

Angle Addition Postulate

$$m\angle 2 + m\angle 3 = 180$$

“” “” “”

$$m\angle 1 + m\angle 2 = m\angle 2 + m\angle 3$$

Substitution

$$m\angle 1 = m\angle 3$$

Subtraction Prop of =

$$\angle 1 \cong \angle 3$$

Defn of congruent angles

Theorem 2-2

Congruent Supplements Theorem

If 2 \angle 's are supplements of the same \angle (or of congruent \angle 's)
then the 2 \angle 's are congruent.

Theorem 2-3

Congruent Complements Theorem

If 2 \angle 's are complements of the same \angle (or of congruent \angle 's)
then the 2 \angle 's are congruent.

Theorem 2-4

All right \angle 's are congruent.

Theorem 2-5

If 2 \angle 's are congruent and supplementary, then each is a
right \angle .