

Geometry

Chapter 2

Section 2-6

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Concept

Theorem - general proposition not self-evident but proved by a chain of reasoning

For many of the theorems we see in this textbook we will attempt to "prove" them using deductive reasoning.

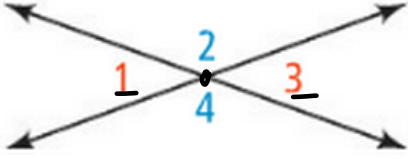
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take note

Theorem 2-1 Vertical Angles Theorem

Vertical angles are congruent.

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



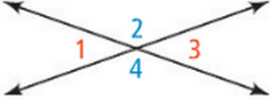
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take note

Theorem 2-1 Vertical Angles Theorem

Vertical angles are congruent.

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



Conditional form:

$\angle 1$ and $\angle 3$ are vertical angles.	<i>Given</i>
$\angle 1$ and $\angle 2$ are supplementary. $\angle 2$ and $\angle 3$ are supplementary.	<i>Given (since supplementary is one of the few things able to be assumed from a diagram)</i>
$m\angle 1 + m\angle 2 = 180$ $m\angle 2 + m\angle 3 = 180$	<i>Definition of Supplementary</i>
$m\angle 1 + m\angle 2 = m\angle 2 + m\angle 3$	<i>Transitive (since both equations above are "= 180")</i>
$m\angle 1 = m\angle 3$	<i>Subtraction Property of Equality</i>
$\angle 1 \cong \angle 3$	<i>Definition of Congruent</i>

Sep 11-7:47 PM

Homework

Write Two-Column Proofs (complete this in notebook): **DUE MONDAY 9/18**

Theorems 2-2, 2-3, 2-4, and 2-5

These will be graded for accuracy and not just completion.

Be neat and organized (use pencil and erase any mistakes).

You may ask me questions about these on review day Friday or via email

May 13-10:02 PM

take note

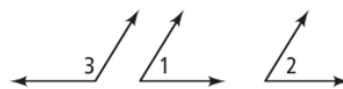
Theorem 2-2 Congruent Supplements Theorem

Theorem

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

If ...

$\angle 1$ and $\angle 3$ are supplements and $\angle 2$ and $\angle 3$ are supplements



You will prove Theorem 2-2 in Problem 3.

Then ...

$\angle 1 \cong \angle 2$

Theorem 2-3 Congruent Complements Theorem

Theorem

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

If ...

$\angle 1$ and $\angle 2$ are complements and $\angle 3$ and $\angle 2$ are complements



You will prove Theorem 2-3 in Exercise 13.

Then ...

$\angle 1 \cong \angle 3$

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Take note

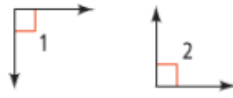
Theorem 2-4

Theorem

All right angles are congruent.

If ...

$\angle 1$ and $\angle 2$ are right angles



Then ...

$\angle 1 \cong \angle 2$

You will prove Theorem 2-4 in Exercise 18.

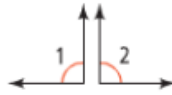
Theorem 2-5

Theorem

If two angles are congruent and supplementary, then each is a right angle.

If ...

$\angle 1 \cong \angle 2$, and $\angle 1$ and $\angle 2$ are supplements



Then ...

$m\angle 1 = m\angle 2 = 90$

You will prove Theorem 2-5 in Exercise 23.

May 13-10:02 PM