AMDG

NAME Ms. Kresovic

Adv Geo - Basic Concepts and Proofs – Chapter 2 – ASN Date

Ch. Sec	Axiom
2.1 Definition (D)	Lines, rays, or segments that intersect at right angles are ________________________________ (⊥).
2.2 D	____ are two angles whose sum is 90° (or a right angle). Each of the two angles is call the ____ of the other.
D	____ are two angles whose sum is 180° (or a straight angle). Each of the two angles is call the ____ of the other.

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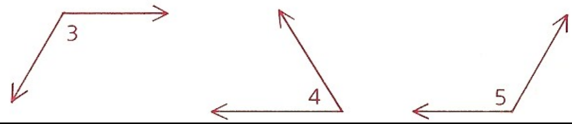
2.4

Theorem (T)

If angles are supplementary to the same angle, then they are congruent.

Given: $\angle 3$ is supp. to $\angle 4$.
$\angle 5$ is supp. to $\angle 4$.

Prove: $\angle 3 \cong \angle 5$



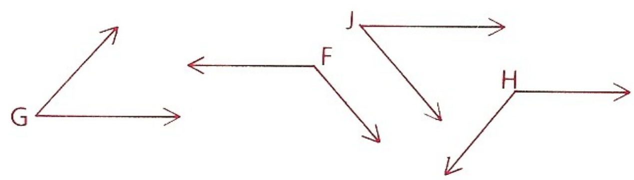
Statements	Reasons
1. $\angle 3$ is supp. to $\angle 4$	1.
2. $m\angle 3 + m\angle 4 = 180$	2.
3. $m\angle 3 = 180 - m\angle 4$	3.
4. $\angle 5$ is supp. to $\angle 4$	4.
5. $m\angle 5 + m\angle 4 = 180$	5.
6. $m\angle 5 = 180 - m\angle 4$	6.
7. $\angle 3 \cong \angle 5$	7.

T

If angles are supplementary to congruent angles, then they are congruent.

Given: $\angle F$ is supp. to $\angle G$.
$\angle H$ is supp. to $\angle J$.
$\angle G \cong \angle J$

Conclusion: $\angle F \cong \angle H$



Statements	Reasons
1. $\angle F$ is supp. to $\angle G$	1.
2.	2.
3.	3.
4. $\angle H$ is supp. to $\angle J$	4.
5.	5.
6.	6.
7. $\angle G \cong \angle J$	7.
8. $\angle F \cong \angle H$	8.

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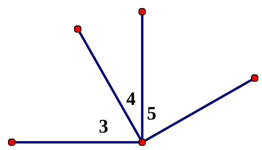
T

If angles are complementary to the same angle, then they are congruent.

Given: $\angle 3$ comp $\angle 4$

$\angle 5$ comp $\angle 4$

Prove: $\angle 3 \cong \angle 5$



Statements	Reasons
1. $\angle 3$ comp $\angle 4$	
2. $m\angle 3 + m\angle 4 =$	
3.	
4. $\angle 5$ comp $\angle 4$	
5. $m\angle 5 + m\angle 4 =$	
6.	
7. $\angle 3 \cong \angle 5$	

T

If angles are complementary to congruent angles, then they are congruent.

Given: $\angle F$ comp $\angle G$

$\angle H$ comp $\angle J$

$\angle G \cong \angle J$

Prove: $\angle F \cong \angle H$

Statements	Reasons
1. $\angle F$ comp $\angle G$	1.
2. $\angle F + \angle G =$	2.
3. $\angle F =$	3.
4. $\angle H$ comp $\angle J$	4.
5. $\angle H + \angle J =$	5.
6. $\angle H =$	6.
7. $\angle G \cong \angle J$	7.
8. $\angle F \cong \angle H$	8.

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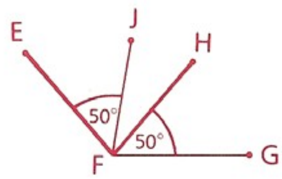
2.5
T

If a segment is added to two congruent segments, the sums are congruent. (Addition Property)

Given: $\overline{PQ} \cong \overline{RT}$
Conclusion: $\overline{PR} \cong \overline{QT}$

Statements	Reasons
1. $\overline{PQ} \cong \overline{RT}$	1.
2. PQ = RT	
3. $\overline{QR} \cong \overline{QR}$	
4. QR = QR	
5. PR = QT	
6. $\overline{PR} \cong \overline{QT}$	

T

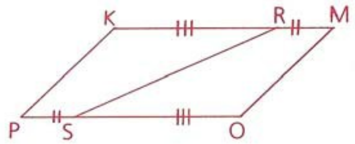
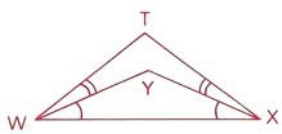


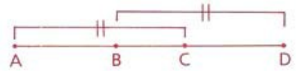
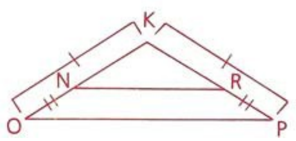
If an angle is added to 2 congruent angles, the sums are congruent. (Addition Property)

Given: ∠EFJ ≅ ∠HFG

Prove; ∠EFH ≅ ∠JFG

Statements	Reasons
1. ∠EFJ ≅ ∠HFG	1.
2. m∠EFJ = m∠HFG	
3. ∠HFJ ≅ ∠JFH	
4. m∠ HFJ = m∠JFH	
5. m∠EFH = m∠JFG	
6. ∠EFH ≅ ∠JFG	

T	If congruent segments are added to congruent segments, the sums are congruent. (Addition Property) 
T	If congruent angles are added to congruent angles, the sums are congruent. (Addition Property) 

T	If a segment (or angle) is subtracted from congruent segments (or angles), the differences are congruent. (Subtraction Property) 
T	If congruent segments (or angles) are subtracted from congruent segments (or angles), the differences are congruent. (Subtraction Property) 

2.6 T	If segments (or angles) are congruent, their like multiples are congruent. (Multiplication Property)
T	If segments (or angles) are congruent, their like divisions are congruent. (Division Property)

2.7 T	If angles (or segments) are congruent to the same angle (or segment) then they are congruent to each other. (Transitive Property)
T	If angles (or segments) are congruent to congruent angles (or segments) then they are congruent to each other. (Transitive Property)
	Substitution or Transitive? In algebra: If $a = b$ and $b = c$, then $a = c$, right? That's transitivity. And if $a = b$ and $b < c$, then $a < c$. That's substitution. In Geometric Proof: If $\angle A \cong \angle B$ and $\angle B \cong \angle C$ then $\angle A \cong \angle C$, right? That's transitivity. (Everything's $\cong$) And if $\angle A \cong \angle B$ and $\angle A = 50°$ then $\angle B = 50°$. That's substitution. (Not **<u>every</u>** thing's $\cong$)

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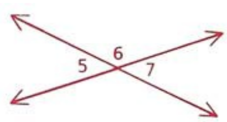
<table>
<tr><td>2.8
D</td><td>Two collinear rays that have a common endpoint and extend in different directions are called ____.</td></tr>
<tr><td>D</td><td>Two angles are _________________________________if the rays forming the sides of one and the rays forming the sides of the other are opposite rays.</td></tr>
<tr><td>T</td><td>Vertical angles are congruent.

Given: Diagram as shown
Prove: $\angle 5 \cong \angle 7$



<table>
<tr><th>Statements</th><th>Reasons</th></tr>
<tr><td>1. $\angle 5$ supp $\angle 6$</td><td></td></tr>
<tr><td>2. $\angle 7$ supp $\angle 6$</td><td></td></tr>
<tr><td>3. $\angle 5 \cong \angle 7$</td><td></td></tr>
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