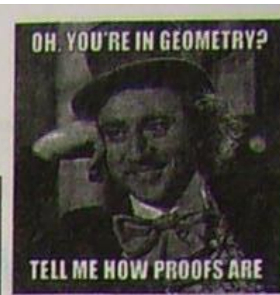
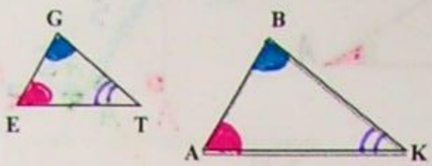
Duh!

Geometry: 7.2 - Mo' Theorems!



Theorem: If 2 angles of a triangle are ≅ to 2 angles of another triangle, then the 3rd angles must be ≅.



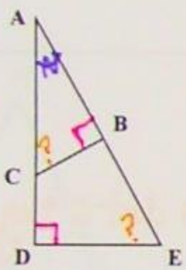
Given: $\angle G \cong \angle B$

$\angle E \cong \angle A$

Conclusion: $\angle T \cong \angle K$

Reason: No Choice Thm

1.



Given: $\overline{AD} \perp \overline{DE}$

$\overline{CB} \perp \overline{AE}$

Prove: $\angle ACB \cong \angle E$

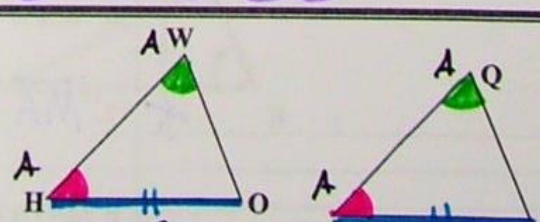
Statements	Reasons
1. $\overline{AD} \perp \overline{DE}$	1. Given
2. $\angle D$ is a rt. $\angle$	2. ⊥ Segs form Rt ∠'s
3. $\overline{CB} \perp \overline{AE}$	3. Given
4. $\angle ABC$ is a rt. $\angle$	4. Same as #2
(A) 5. $\angle ABC \cong \angle D$	5. All Rt ∠'s are ≅
(A) 6. $\angle A \cong \angle A$	6. Reflexive Property
7. $\angle ACB \cong \angle E$	7. No Choice Thm

And introducing a NEW theorem for proving triangles congruent!

Given: $\angle W \cong \angle Q$

$\angle H \cong \angle U$

$\overline{OH} \cong \overline{TU}$



Conclusion: $\Delta WHO \cong \Delta QUT$ by AAS

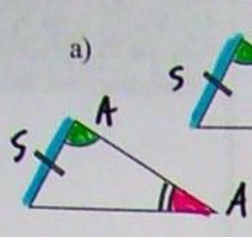
* Corresponding Parts of Congruent Triangles are Congruent

7.1 Notes: Triangle Application Theorems

Name the 5 methods we have learned to prove triangles congruent:
SSS, SAS, ASA, HL, AAS

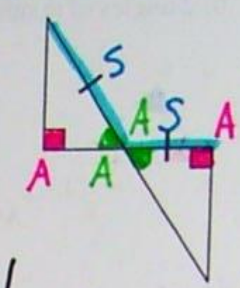
2. Are the 2 triangles congruent by AAS? (yes or no)

a)



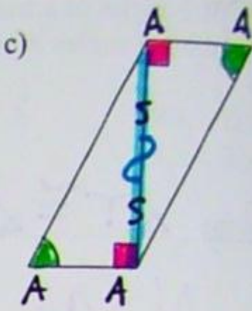
Yes

b)



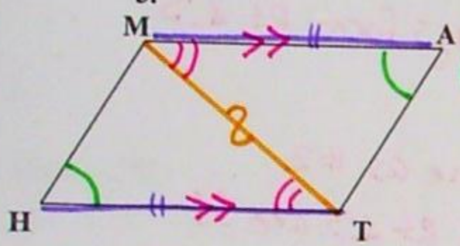
No

c)



Yes

3.



Given: $\angle H \cong \angle A$
$\overline{MA} \parallel \overline{HT}$

Prove: MATH is a ▱

	Statements	Reasons
(A)	1. $\angle H \cong \angle A$	1. Given
	2. Draw $\overline{MT}$	2. 2 pts det a seg
*	3. $\overline{MA} \parallel \overline{HT}$	3. Given
(A)	4. $\angle AMT \cong \angle HTM$	4. ∥ lines → alt int ∠s ≅
(S)	5. $\overline{MT} \cong \overline{MT}$	5. Reflexive Prop
	6. $\Delta MHT \cong \Delta TAM$	6. AAS (1, 4, 5)
*	7. $\overline{MA} \cong \overline{HT}$	7. CPCTC
	8. MATH is a ▱	8. If quad has one pair opp sides BOTH ≅ & ∥ → ▱

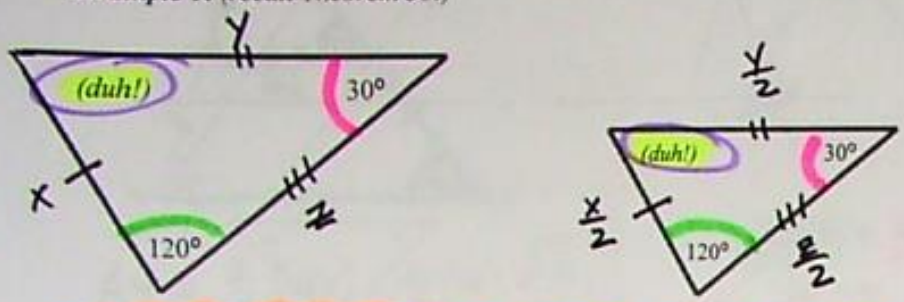
7.1 Notes: Triangle Application Theorems

7.2 Two Proof-Oriented Triangle Theorems

Your book refers to the following as the NO-CHOICE Theorem.

Theorem 53: If two angles of one triangle are congruent to two angles of a 2nd triangle, then the 3rd angles are congruent. ***(No- Choice Theorem)***

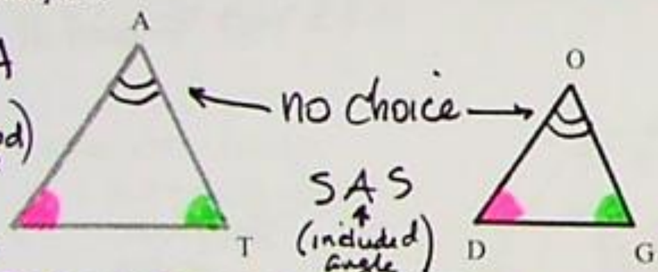
Example 1: *(recall Theorem 50!)*



NOTE: The two triangles **DO NOT** have to be ***congruent*** in order to apply the "No-Choice" Theorem

Example 2:

ASA (included side)



Given:
$\angle C \cong \angle D$
$\angle T \cong \angle G$

Conclusion: $\angle A \cong \angle O$

Reason: No-Choice Thm

Theorem 54: (AAS) If two angles and a non- included side of one triangle are congruent to the corresponding two angles and non- included side of a second triangle then the triangles are congruent.

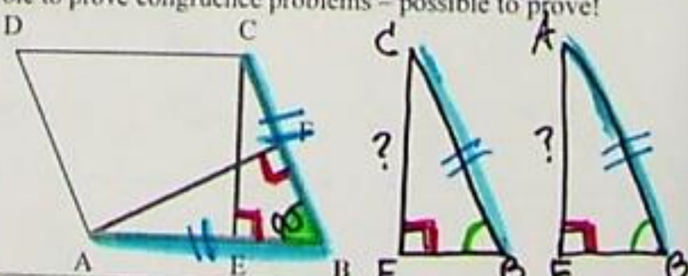
AAS (non-included side)

This theorem makes some of the earlier, impossible to prove congruence problems – possible to prove!

Example:

Given:
ABCD is a Rhombus
AF ⊥ CB
CE ⊥ AB

Prove: $\boxed{CE \cong AF}$



1 ABCD is a Rhombus	1 Given
(S) 2 AB ≅ CB	2 All sides of a rhombus are ≅
3 AF ⊥ CB, CE ⊥ AB	3 Given
(A) 4 ∡ CEB ≅ ∡ AFB	4 ⊥ segs form ≅ rt ∡'s
(A) 5 ∡B ≅ ∡B	5 Reflexive Property
6 Δ CEB ≅ Δ AFB	6 AAS (4,5,2)
7 CE ≅ AF	7 CPCTC

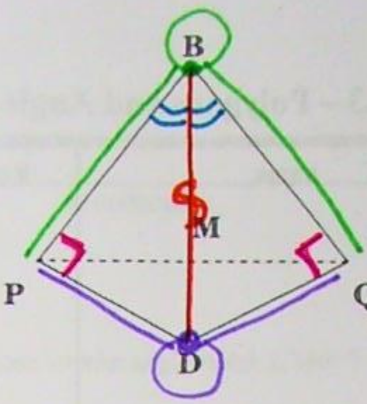
7.2 Two-Proof Oriented Triangle Theorems — Geometry Examples

Example 3: *(Opener from pg 307 TE)*

Given: *Ray $\overrightarrow{BD}$ bisects $\measuredangle PBQ$*
$\overline{PD} \perp \overline{PB}$, $\overline{QD} \perp \overline{QB}$

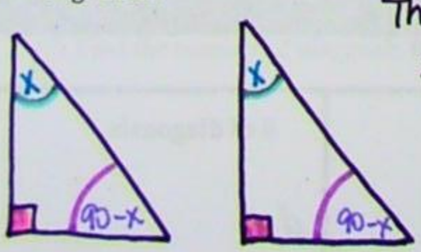
Prove: *Line $\overline{BD}$ is the $\perp$ bisector of $\overline{PQ}$*

equidistance thm



Statements	Reasons
1. $\overrightarrow{BD}$ bis $\measuredangle PBQ$	1. Given
2. $\measuredangle PBD \cong \measuredangle QBD$ (A)	2. A bis $\measuredangle$ is ÷ into 2 $\cong$ $\measuredangle$'s
3. $\overline{PD} \perp \overline{PB}$; $\overline{QD} \perp \overline{QB}$	3. Given
4. $\measuredangle BPD \cong \measuredangle BQD$ (A)	4. $\perp$ segs form $\cong$ Rt $\measuredangle$'s
5. $\overline{BD} \cong \overline{BD}$ (S)	5. Reflexive Property
6. $\triangle BPD \cong \triangle BQD$	6. AAS (2, 4, 5)
7. $\overline{DP} \cong \overline{DQ}$ (•D)	7. CPCTC
8. $\overline{BP} \cong \overline{BQ}$	8. CPCTC
9. $\overline{BD}$ $\perp$ bis $\overline{PQ}$	9. If 2pts are =dist from endpts of seg, they det $\perp$ bis of seg
10.	10.

Explain: *If two right triangles have a pair of congruent acute angles, why must the other pair of acute angles also be congruent?*



The two acute angles of a right $\triangle$ are comp.
If one acute angle in each triangle is "x",
then the other acute angle equals $90-x$,
by "No Choice"! $\boxed{180-(90)-x = 90-x}$
Sum of all angles = 180°

You Do: *Please read section 7.2, study sample problems, take notes and record/memorize any properties, theorems, etc.* **Assignment:** 7·2 Assign: Pp 304 - 305 (1 - 10)