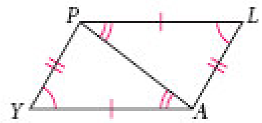
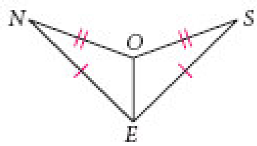
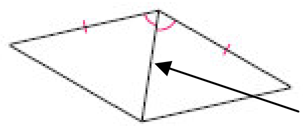
Solutions to Ch 4 Practice Test (Textbook pg. 236)

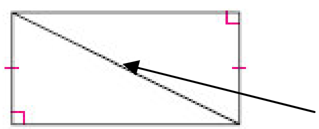
1. 

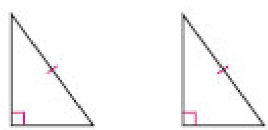
$\Delta PAY \cong \Delta APL$ Letters must match as pairs

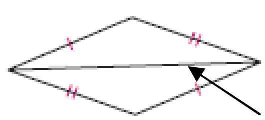
2. 

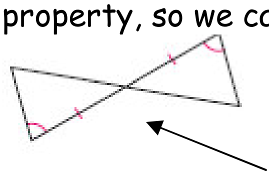
$\Delta NOE \cong \Delta SOE$ Letters must match as pairs

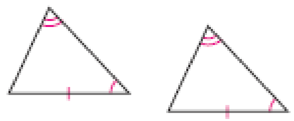
3. 
This side is congruent to itself by the Reflexive property, so you can use SAS.

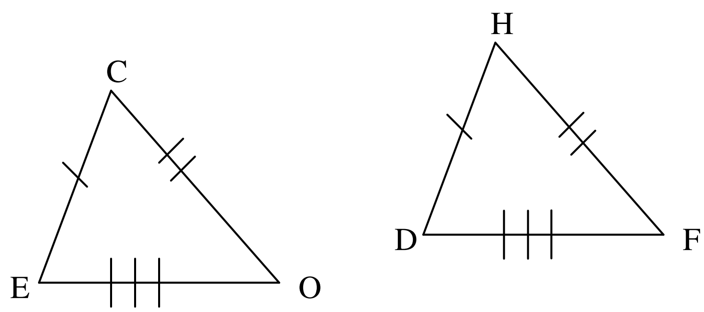
4. 
This side is congruent to itself by the Reflexive property, so you can use H-L. (The shared side is the hypotenuse in both triangles.)

5. 
Nothing is shared, nothing overlaps, and there are no vertical angles, so we cannot prove triangle congruence with the given information. (We would need a leg or another angle to prove it.)

6. 
This side is congruent to itself by the reflexive property, so we can use SSS to prove the triangles congruent.

7. 
There are 2 vertical angles (therefore there are two congruent angles) at this vertex, so we can use ASA to prove the triangles congruent.

8.  The triangles each have two angles marked and one side in each is congruent and adjacent to the single-arc angle. Therefore, we can use AAS to prove congruence.
9. Refer to page 202. There is a great diagram regarding AAA which shows in a general case why it cannot be used to prove triangle congruence. In a more specific case, consider two equilateral triangles, one with sides of length 5 and the other with sides of length 12. These two triangles have AAA similarity (all angles in both triangles are 60°). However, since the sides are not congruent from one triangle to the next, there cannot be congruence.
10.



$\overline{CE} \cong \overline{HD}$; $\overline{CO} \cong \overline{HF}$; $\overline{EO} \cong \overline{DF}$; $\angle C \cong \angle H$; $\angle E \cong \angle D$; $\angle O \cong \angle F$

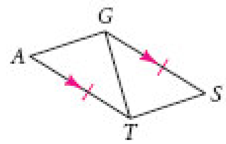
11. They are not necessarily congruent. Consider one board that is 12"x12" and another that is 24"x6". Both have areas of 144 in^2. However, one is a square and the other is a long rectangle.
12. Since there are two marked angles in each triangle, by theorem 4-1, the third angles must be congruent. This results in the following equation:

$$3x = 108$$
$$x = 36$$

13.

Given: $\overline{AT} \cong \overline{GS}$, $\overline{AT} \parallel \overline{GS}$

Prove: $\triangle GAT \cong \triangle TSG$

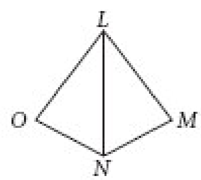


Statements	Reasons
1. $\overline{AT} \cong \overline{GS}$ $\overline{AT} // \overline{GS}$	1. Given
2. $\angle SGT \cong \angle ATG$	2. Alternate Interior Angle Thm. (AIA)
3. $\overline{GT} \cong \overline{TG}$	3. Reflexive property of congruence
4. $\Delta GAT \cong \Delta TSG$	4. SAS Postulate ■

14.

Given: $\overline{LN}$ bisects $\angle OLM$ and $\angle ONM$.

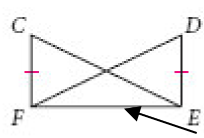
Prove: $\triangle OLN \cong \triangle MLN$



Statements	Reasons
1. $\overline{LN}$ bisects $\angle OLM$ and $\angle ONM$	1. Given
2. $\angle OLN \cong \angle MLN$ $\angle ONL \cong \angle MNL$	2. Definition of bisector
3. $\overline{LN} \cong \overline{LN}$	3. Reflexive property of congruence
4. $\Delta OLN \cong \Delta MLN$	4. ASA Postulate ■

15.

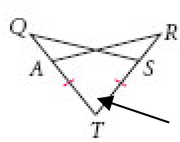
Given: $\overline{CE} \cong \overline{DF}$, $\overline{CF} \cong \overline{DE}$



This side is congruent to itself by the reflexive property, so $\Delta CFE \cong \Delta DEF$ by SSS.

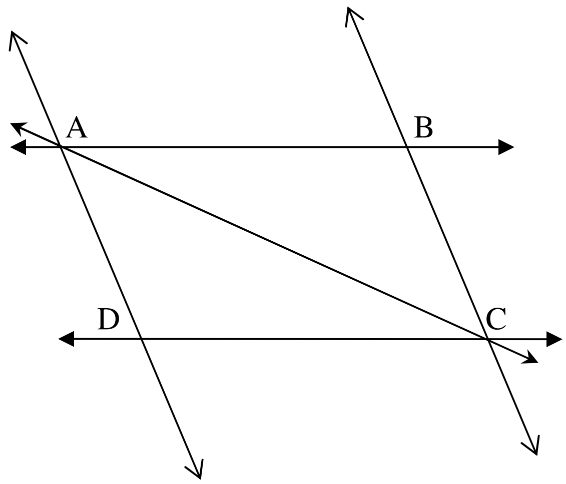
16.

Given: $\overline{RT} \cong \overline{QT}$, $\overline{AT} \cong \overline{ST}$



$\angle T$ is congruent to itself by the reflexive property so $\Delta QTS \cong \Delta RTA$ by SAS.

17. Example: $\overline{AD} // \overline{BC}$, $\overline{AB} // \overline{DC}$



$\Delta ABC \cong \Delta CDA$