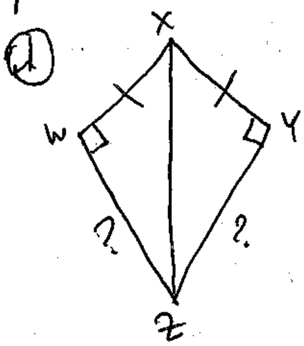
HW #37 Solutions

OB: p. 143-144 #1, p. 145 #19
GB: p. 131 #14

p. 143

1.

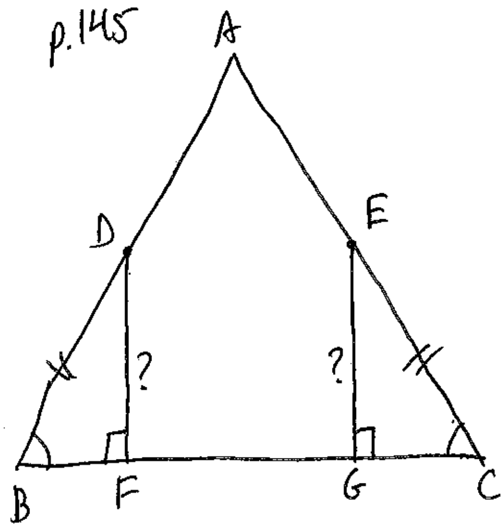


Given: $\angle W$ and $\angle Y$ are right $\angle$'s.
$\overline{WX} \cong \overline{YX}$

Prove: $\overline{WZ} \cong \overline{YZ}$

Statements	Reasons
1. $\angle W$ and $\angle Y$ are right $\angle$'s.	1. Given.
2. $\triangle XWZ$ and $\triangle XYZ$ are right triangles.	2. A right triangle contains one right angle. (1).
3. $\overline{XZ} \cong \overline{XZ}$ (hyp $\cong$ hyp)	3. Reflexive Property.
4. $\overline{WX} \cong \overline{YX}$ (leg $\cong$ leg)	4. Given.
5. $\triangle XWZ \cong \triangle XYZ$	5. Hyp-leg Theorem. (2,3,4).
6. $\overline{WZ} \cong \overline{YZ}$	6. Corresponding parts of congruent triangles are congruent. (5).

p. 145



Given: $\triangle ABC$ with $\overline{AB} \cong \overline{AC}$
D is the midpoint of $\overline{AD}$
E is the midpoint of $\overline{AC}$.
$\overline{DF} \perp \overline{BC}$
$\overline{EG} \perp \overline{BC}$

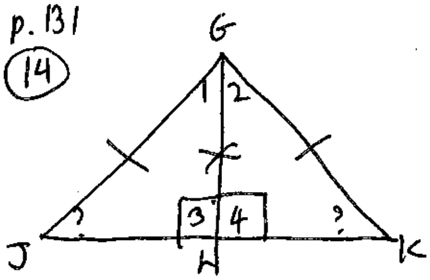
Prove: $\overline{DF} \cong \overline{EG}$

Statements	Reasons
1. $\triangle ABC$ with $\overline{AB} \cong \overline{AC}$	1. Given.
2. $\angle ABC \cong \angle ACB$ (a $\cong$ a)	2. If two sides of a triangle are congruent, then the angles opposite them are congruent. (1).
3. $\overline{DF} \perp \overline{BC}$, $\overline{EG} \perp \overline{BC}$	3. Given.
4. $\angle DFB$ and $\angle EGC$ are right angles.	4. Definition of perpendicular lines. (3)
5. $\angle DFB \cong \angle EGC$ (a $\cong$ a)	5. All right angles are congruent. (4).
6. D is the midpoint of $\overline{AB}$, E is the midpoint of $\overline{AC}$.	6. Given.
7. $BD = \frac{1}{2}AB$, $EC = \frac{1}{2}AC$	7. A midpoint divides a segment into two segments half as long as the original. (6)
8. $\overline{BD} \cong \overline{EC}$ (s $\cong$ s)	8. Halves of congruent segments are congruent. (1,7).
9. $\triangle DBF \cong \triangle ECG$	9. AAS Theorem. (2,5,8).
10. $\overline{DF} \cong \overline{EG}$	10. Corresponding parts of congruent triangles are congruent. (9).

GB

p. 131

(14)



Given: $\overline{GH} \perp \overline{JK}$

$\overline{JG} \cong \overline{KG}$

Prove: $\angle J \cong \angle K$.

*Note: I realize that this is doable in a single step using the properties of Isosceles triangles. However, this problem was presented before the mention of any of the Isosceles triangles.[1] Thus, I will refrain from using them. Think of this as a self-imposed challenge.

Statements	Reasons
1. $\overline{GH} \perp \overline{JK}$	1. Given.
2. $\angle 3$ and $\angle 4$ are right angles.	2. Definition of perpendicular lines. (1).
3. $\triangle GJH$ and $\triangle GKH$ are right angles.	3. A right triangle contains one right angle. (2).
4. $\overline{JG} \cong \overline{KG}$ (hyp $\cong$ hyp)	4. Given.
5. $\overline{GH} \cong \overline{GH}$ (leg $\cong$ leg)	5. Reflexive Property.
6. $\triangle GJH \cong \triangle GKH$	6. Hyp-leg Theorem. (3, 4, 5).
7. $\angle J \cong \angle K$	7. Corresponding parts of congruent triangles are congruent. (6).

[1] In the green book, that is.