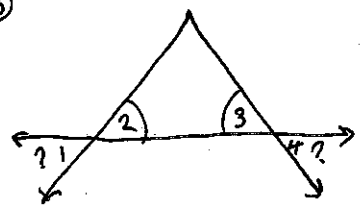
HW #20 Solutions: (Proofs only!)

OB p. 53 #23, p. 58 # 2, p. 62 #7
GB p. 118 #21.

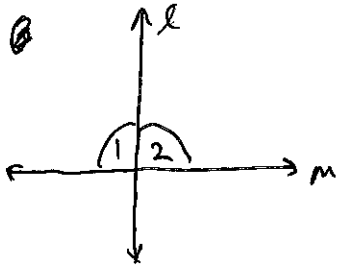
p. 53
(23)



Given: $\angle 2 \cong \angle 3$
Prove: $\angle 1 \cong \angle 4$

Statements	Reasons
1. $\angle 2 \cong \angle 3$	1. Given.
2. $\angle 1 \cong \angle 2$	2. Vertical angles are congruent.
3. $\angle 3 \cong \angle 4$	3. Vertical angles are congruent.
4. $\angle 1 \cong \angle 3$	4. Transitive Property. (1, 2)
5. $\angle 1 \cong \angle 4$	5. Transitive Property (3, 4).

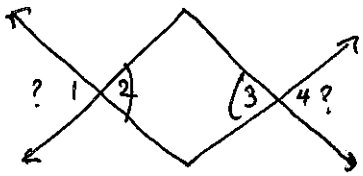
p. 58
(2)



Given: $\angle 1 \cong \angle 2$
Prove: $\ell \perp m$

Statements	Reasons
1. $\angle 1 \cong \angle 2$	1. Given.
2. $m\angle 1 = m\angle 2$	2. Definition of congruence. (1).
3. $\angle 1$ and $\angle 2$ are supplementary.	3. If two angles form a linear pair, then they are supplementary.
4. $m\angle 1 + m\angle 2 = 180°$	4. Definition of supplementary angles. (3).
5. $m\angle 2 + m\angle 2 = 180°$ -or- $2m\angle 2 = 180°$	5. Substitution Postulate (2, 4).
6. $m\angle 2 = 90°$	6. Division Postulate (5).
7. $\angle 2$ is a right angle.	7. Right angles measure 90°. (6).
8. $\ell \perp m$	8. Definition of perpendicular lines. (7).

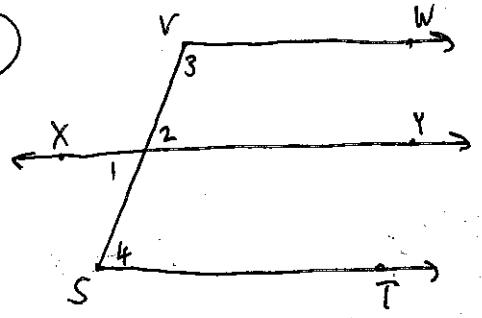
p. 62
(7)



Given: $\angle 2 \cong \angle 3$
Prove: $\angle 1 \cong \angle 4$

Statements	Reasons
1. $\angle 2 \cong \angle 3$	1. Given.
2. $\angle 1 \cong \angle 2$	2. Vertical angles are congruent.
3. $\angle 3 \cong \angle 4$	3. Vertical angles are congruent.
4. $\angle 1 \cong \angle 3$	4. Transitive Property. (1, 2).
5. $\angle 1 \cong \angle 4$	5. Transitive Property. (3, 4).

(21)



Given: $m\angle 1 = m\angle 4$
$\angle 3$ and $\angle 4$ are supplementary.

Prove: $\angle 2$ and $\angle 3$ are supplementary.

Statements	Reasons
1. $m\angle 1 = m\angle 4$	1. Given.
2. $\angle 1 \cong \angle 2$	2. Vertical angles are congruent.
3. $m\angle 1 = m\angle 2$	3. Definition of congruence. (2).
4. $m\angle 2 = m\angle 4$	4. Substitution Postulate. (1, 3).
5. $\angle 3$ and $\angle 4$ are supplementary.	5. Given.
6. $m\angle 3 + m\angle 4 = 180°$	6. Definition of supplementary. (5).
7. $m\angle 3 + m\angle 2 = 180°$	7. Substitution Postulate. (4, 6).
8. $\angle 2$ and $\angle 3$ are supplementary.	8. Definition of supplementary. (7)