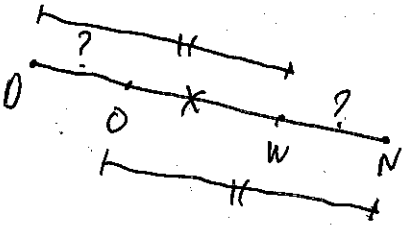
HW #17 Solutions

OB p. 42 #9, 11, 12
GB p. 107 #15, 18

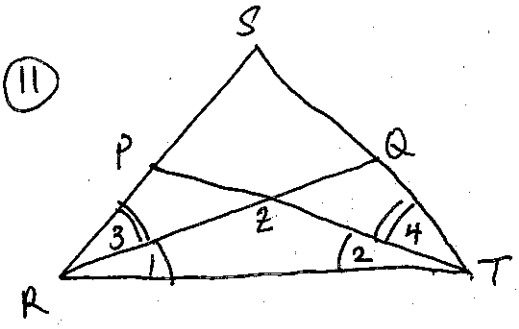
(9)



Given: $DW = ON$
Prove: $DO = WN$

Statements	Reasons
1. $DW = ON$	1. Given.
2. $DW = DO + OW$, $ON = OW + WN$	2. Partition Postulate.
3. $DO + OW = OW + WN$	3. Substitution Postulate (1, 2).
4. $OW = OW$	4. Reflexive Property.
5. $DO + OW - OW = OW + WN - OW$	5. Subtraction Postulate. (3, 4).
— or —	
$DO = WN$	

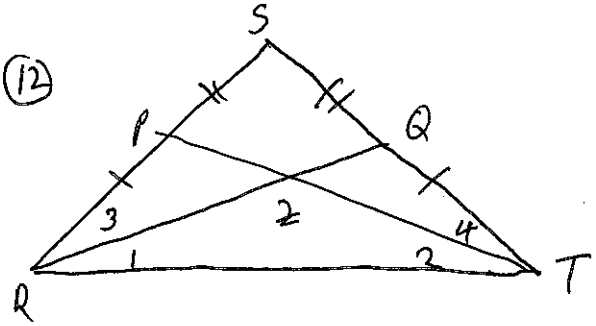
(11)



Given: $m\angle 1 = m\angle 2$
$m\angle 3 = m\angle 4$
Prove: $m\angle SRT = m\angle STR$

Statements	Reasons
1. $m\angle 1 = m\angle 2$	1. Given.
2. $m\angle 3 = m\angle 4$	2. Given.
3. $m\angle 1 + m\angle 3 = m\angle 2 + m\angle 4$	3. Addition Postulate (1, 2)
4. $m\angle SRT = m\angle 1 + m\angle 3$, $m\angle STR = m\angle 2 + m\angle 4$	4. Partition Postulate.
5. $m\angle SRT = m\angle STR$	5. Substitution Postulate (3, 4).

(12)



Given: $RP = TQ$
$PS = QS$
Prove: $RS = TS$.

Statements	Reasons
1. $RP = TQ$	1. Given.
2. $PS = QS$	2. Given.
3. $RP + PS = TQ + QS$	3. Addition Postulate (1, 2).
4. $RS = RP + PS$, $TS = SQ + QT$	4. Partition Postulate.
5. $RS = TS$	5. Substitution Postulate (3, 4).

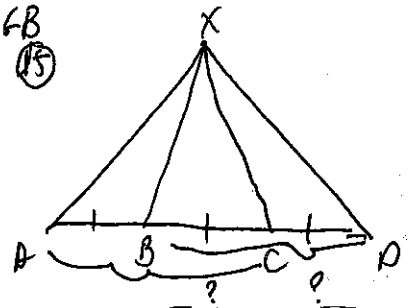
* Note: Now that we have our "shortcut," we don't need to go very deeply into the main postulates; in #11 and 12, we can eliminate steps 3-5 and instead say, for instance:

#11:

3. $m\angle 1 + m\angle 3 = m\angle 2 + m\angle 4$ — or — $m\angle SRT = m\angle STR$	3. Addition Postulate (1, 2).

The following proofs will use the shortcut.

GB
(15)

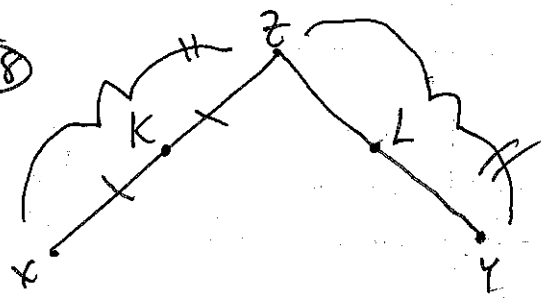


Given: $\overline{XB}$ bisects $\overline{AC}$
$\overline{XC}$ bisects $\overline{BD}$.

Prove: $AC = BD$.

Statements	Reasons
1. $\overline{XB}$ bisects $\overline{AC}$.	1. Given.
2. B is the midpoint of $\overline{AC}$.	2. Definition of segment bisector. (1).
3. $\overline{AB} \cong \overline{BC}$	3. Definition of midpoint. (2).
4. $\overline{XC}$ bisects $\overline{BD}$.	4. Given.
5. C is the midpoint of $\overline{BD}$.	5. Definition of segment bisector. (4).
6. $\overline{BC} \cong \overline{CD}$	6. Definition of midpoint. (5).
7. $\overline{AB} + \overline{BC} \cong \overline{BC} + \overline{CD}$ -or- $\overline{AC} \cong \overline{BD}$	7. Addition Postulate. (3, 6).
8. $AC = BD$	8. Definition of congruence. (7).

(18)



Given: $YZ = XZ$.
K is the midpoint of $\overline{XZ}$.

Prove: $YZ = 2KZ$

Statements	Reasons
1. K is the midpoint of $\overline{XZ}$	1. Given.
2. $\overline{XK} \cong \overline{KZ}$	2. Definition of midpoint. (1)
3. $XK = KZ$	3. Definition of congruence. (2)
4. $XK + KZ = XZ$	4. Partition Postulate.
5. $KZ + KZ = XZ$ -or- $2KZ = XZ$	5. Substitution Postulate. (3, 4).
6. $YZ = XZ$	6. Given.
7. $2KZ = YZ$	7. Substitution Postulate. (5, 6).