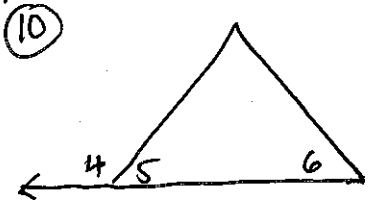
HW #18 Solutions:

OB p. 42 #10-13, p. 48 #10
GB p. 112 #25

Note: As we have already covered the shortcut, I will be using it throughout this set. Also, my apologies about #10 — at the time, we did not have our theorems regarding linear pairs. The proof will be using that theorem to justify some reasons. Apologies.

p. 42

(10)

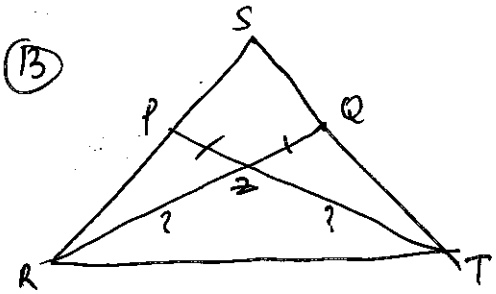


Given: $m\angle 4 + m\angle 6 = 180°$
Prove: $m\angle 5 = m\angle 6$

Statements	Reasons
1. $m\angle 4 + m\angle 6 = 180°$	1. Given.
2. $\angle 4$ and $\angle 5$ are supplementary.	2. If two angles form a linear pair, then they are supplementary.
3. $m\angle 4 + m\angle 5 = 180°$	3. Definition of supplementary angles. (2).
4. $m\angle 4 + m\angle 5 = m\angle 4 + m\angle 6$	4. Transitive Property. (1, 3)
5. $m\angle 4 = m\angle 4$	5. Reflexive Property.
6. $m\angle 5 = m\angle 6$	6. Subtraction Postulate. (4, 5)

Please refer to the previous solution set for proofs for #11 and #12.

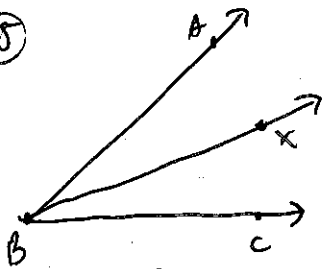
(13)



Given: $RQ = TP$
$ZQ = ZP$
Prove: $RZ = TZ$

Statements	Reasons
1. $RQ = TP$	1. Given.
2. $ZQ = ZP$	2. Given.
3. $RQ - ZQ = TP - ZP$ -or- $RZ = TZ$	3. Subtraction Postulate. (1, 2).

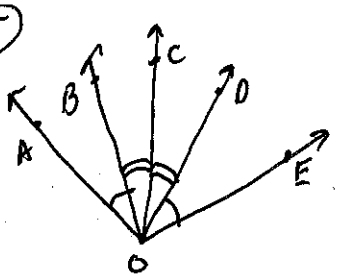
(15)



Given: $\overrightarrow{BX}$ bisects $\angle ABC$.
Prove: $m\angle ABX = \frac{1}{2} m\angle ABC$,
$m\angle XBC = \frac{1}{2} m\angle ABC$.

Statements	Reasons
1. $\overrightarrow{BX}$ bisects $\angle ABC$.	1. Given.
2. $\angle ABX \cong \angle XBC$	2. Definition of angle bisector. (1).
3. $m\angle ABX = m\angle XBC$	3. Definition of congruence. (2).
4. $m\angle ABX + m\angle XBC = m\angle ABC$	4. Partition Postulate.
5. $m\angle ABX + m\angle ABX = m\angle ABC$ -or- $2\, m\angle ABX = m\angle ABC$	5. Substitution Postulate. (3, 4).
6. $m\angle ABX = \frac{1}{2} m\angle ABC$.	6. Division Postulate. (5) (Or, Halves of equal quantities are equal.)
7. $m\angle XBC = \frac{1}{2} m\angle ABC$.	7. Substitution Postulate. (3, 6).

(25)



Given: $m\angle EOD = m\angle BOA$
$\overrightarrow{OC}$ bisects $\angle DOB$
Prove: $\overrightarrow{OC}$ bisects $\angle AOE$.

Statements	Reasons
1. $m\angle EOD = m\angle BOA$	1. Given.
2. $\overrightarrow{OC}$ bisects $\angle DOB$	2. Given.
3. $\angle BOC \cong \angle DOC$	3. Definition of angle bisector. (2).
4. $m\angle BOC = m\angle DOC$	4. Definition of congruence. (3).
5. $m\angle EOD + m\angle DOC = m\angle BOA + m\angle BOC$ -or- $m\angle AOC = m\angle EOC$	5. Addition Postulate. (1, 4).
6. $\angle AOC \cong \angle EOC$	6. Definition of congruence. (5).
7. $\overrightarrow{OC}$ bisects $\angle AOE$	7. Definition of angle bisector. (6).