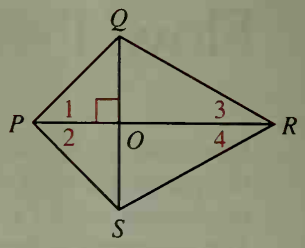
Example 2 Given: $\overline{QS} \perp \overline{PR}$;
$\overrightarrow{PR}$ bisects $\angle QPS$.
Prove: $\overrightarrow{RP}$ bisects $\angle QRS$.



Flow Proof:

1. $\overline{QS} \perp \overline{PR}$ → 3. $\angle POQ \cong \angle POS$
2. $\overrightarrow{PR}$ bis. $\angle QPS$ → 4. $\angle 1 \cong \angle 2$
5. $\overline{PO} \cong \overline{PO}$

→ 6. $\triangle POQ \cong \triangle POS$

→ 7. $\overline{PQ} \cong \overline{PS}$
8. $\overline{PR} \cong \overline{PR}$
9. $\angle 1 \cong \angle 2$

→ 10. $\triangle PQR \cong \triangle PSR$ → 11. $\angle 3 \cong \angle 4$ → 12. $\overrightarrow{RP}$ bis. $\angle QRS$.

Reasons

1. Given
2. Given
3. If two lines are $\perp$, then they form $\cong$ adj. $\angle$s.
4. Def. of $\angle$ bisector
5. Reflexive Prop.
6. ASA Postulate
7. Corr. parts of $\cong$ $\triangle$s are $\cong$.
8. Reflexive Prop.
9. See Step 4. (Repeating this makes Step 10 easier to follow.)
10. SAS Postulate
11. Corr. parts of $\cong$ $\triangle$s are $\cong$.
12. Def. of $\angle$ bisector

When you are working on a flow proof, you may find it helpful to wait until you have completed the structure of the proof before numbering the steps. You might work backwards from the statement you wish to prove, for example, filling in the intermediate steps until you arrive at given statements. Then you can number the steps and give the reasons underneath. Sometimes there will be more than one correct way to do this; just make sure that the number at the head of each arrow is always greater than the number(s) at the tail of the arrow.

Exercises

Write a flow proof for each exercise referred to below.

1. Exercise 3, page 130
2. Exercise 16, page 125
3. Exercise 15, page 145
4. Exercise 13, page 81
5. Exercise 17, page 126
6. Exercise 2, page 143
7. Exercise 7, page 149
8. Exercise 24, page 82
9. Exercise 20, page 145