Geometry(H) Worksheet: Proofs in Two-column Form

On separate paper, write a two-column proff for each problem below. Follow the plan provided for help.



1. Given: RT ≅ SU Prove: RS = TU

Plan: Use the definition of congruent segments to write the given information in terms of lengths. Next use the Segment Addition Postulate to write RT in terms of RS + ST and SU as ST + TU. Substitute those into the given information and use the Subtraction Property of Equality to eliminate ST and leave RS = TU.



Given: m∠5 = 47°
Prove: m∠6 = 133°

Plan: Use the Angle Addition Postulate to show that $m \downarrow 5 + m \downarrow 6 = 180^{\circ}$. Then use subsitution and then subtraction to show that $m \downarrow 6 = 133^{\circ}$.



3. Given: AB = BCBC = BD Prove: B is the midpoint of \overline{AD}

Plan: Write the "Given" information and use the transitive property to show that AB = BD. Then use the definition of congruence to show that the segments are congruent and the definition of midpoint to finish the proof.



4. Given: / bisects MN at P Prove: MP = PN

Plan: Use the definition of bisect to show that the two smaller segments are congruent. Then use the definition of congruence to show that their lengths are equal.



Plan: Use the definition of supplementary angles and congruent angles to write the given information in terms of angl measures. Next use substitution to show that $m_{\perp}3 + m_{\perp}2 = 180^{\circ}$. Then use the definition of supplementary angles for the conclusion.

Write proofs in two-column form for each theorem below.

6. If two lines are cut by a transversal so that alternate exterior angles are congruent, then the lines are parallel.

Prove: a || b



7. Midpoint Theorem: If M is the midpoint of \overline{AB} , then $AM = \frac{1}{2}AB$ and $MB = \frac{1}{2}AB$

8. Angle Bisector Theorem: If \overrightarrow{BX} is the bisector of $\angle ABC$, then $m\angle ABX = \frac{1}{2}m\angle ABC$ and $m\angle XBC = \frac{1}{2}m\angle ABC$