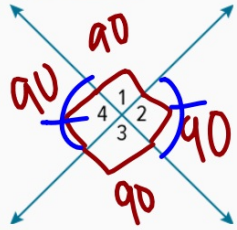
7. **Given: <1 = <4**

Prove: $\angle 1$ and $\angle 2$ are right angles.



Proof:

Statements	Reasons
1. $\angle 1 \cong \angle 4$	1. Given
2. $\angle 2 \cong \angle 4$	2. vertical angles
3. $\angle 4 \cong \angle 2$	3. symmetric
4. <1 = <2	4. transitive
5. <1 & <2 are a linear pair	5. Def. of linear pair
6. <1 & <2 are right angles	6. If two congruent angles form a linear pair, then they are right angles.

90 = 90

90 = 90

$\angle 1 \cong 4 \mid 4 \cong 2$ 90°

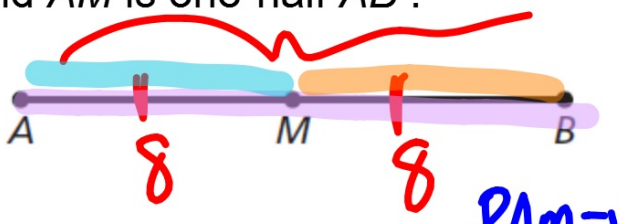
flip symmetry

180

8. Prove this property of midpoints: If you know that M is the midpoint of $\overline{AB}$ prove that AB is two times AM and AM is one-half AB.

Given M is the midpoint of $\overline{AB}$

Prove $AB = 2AM$ $AM = \frac{1}{2}AB$



STATEMENTS	REASONS
1. M is the midpoint of $\overline{AB}$.	1. Given
2. $\overline{AM} \cong \overline{MB}$	2. Definition of midpoint
3. $AM = MB$	3. Definition of congruent segments
4. $AM + MB = AB$	4. Segment Addition Postulate (Post. 1.2)
5. $AM + AM = AB$	5. Substitution Property of Equality
6. $2AM = AB$	6. ~~Combine Like Terms~~/Simplify
7. $AM = \frac{1}{2}AB$	7. Division Property of Equality