MIDPOINT THEOREM

If M is the midpoint of AB then $AM = \frac{1}{2}AB$ and $MB = \frac{1}{2}AB$

Given: M is midpoint of AB

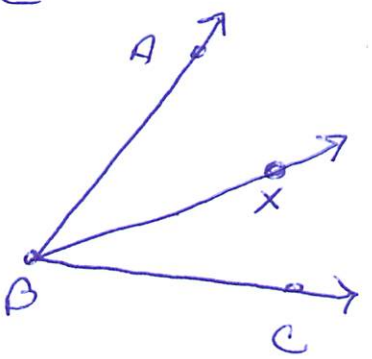
Prove: $AM = \frac{1}{2}AB$

$MB = \frac{1}{2}AB$

STATEMENTS	REASONS
① M is midpoint of AB	① Given
② $AM = MB$	② Definition of midpoint
③ $AM + MB = AB$	③ segment Add postulate
④ $AM + AM = AB$	④ substitution =
⑤ $2 \cdot (AM) = AB$	⑤ combine like terms
⑥ $AM = \frac{1}{2}AB$	⑥ Division POE
⑦ $MB = \frac{1}{2}AB$	⑦ substitution

Angle Bisector Theorem

If $\overrightarrow{BX}$ is the bisector of $\angle ABC$ then $m\angle ABX = \frac{1}{2} m\angle ABC$ AND $m\angle XBC = \frac{1}{2} m\angle ABC$



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. $m\angle ABX = m\angle XBC$	2. Definition of angle bisector
3. $m\angle ABX + m\angle XBC = m\angle ABC$	3. Angle Addition post.
4. $m\angle ABX + m\angle ABX = m\angle ABC$	4. substitution
5 2. $m\angle ABX = m\angle ABC$	5. Combine like terms
6. $m\angle ABX = \frac{1}{2} m\angle ABC$	6. Division POC
7. $m\angle XBC = \frac{1}{2} m\angle ABC$	7. substitution