5 Essential parts of a good proof:

1) State the theorem or conjecture to be proven.

2) List the given information.

3) If possible, draw a diagram to illustrate the given information.

4) State what is to be proved.

5) Develop a system of deductive reasoning - do the proof.

Definitions that are used in proof, along with properties:

Definition of midpoint: If X is the midpoint of $\overline{AB}$, then $AX = XB$.

Definition of congruent segments:

If $\overline{AB} \cong \overline{XY}$, then $AB = XY$.

and

If $AB = XY$, then $\overline{AB} \cong \overline{XY}$.

Definition of congruent angles:

If $\angle A \cong \angle B$, then $m\angle A \cong m\angle B$.

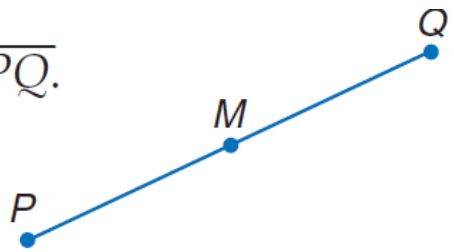
and

If $m\angle A \cong m\angle B$, then $\angle A \cong \angle B$.

Given that M is the midpoint of $\overline{PQ}$, write a paragraph proof to show that $\overline{PM} \cong \overline{MQ}$.

Given: M is the midpoint of $\overline{PQ}$.

Prove: $\overline{PM} \cong \overline{MQ}$



From the definition of midpoint of a segment, $PM = MQ$. This means that $\overline{PM}$ and $\overline{MQ}$ have the same measure. By the definition of congruence, if two segments have the same measure, then they are congruent. Thus, $\overline{PM} \cong \overline{MQ}$.

Given that $\overline{AC} \cong \overline{CB}$, and C is between A and B, write a paragraph proof to show that C is the midpoint of $\overline{AB}$.

Given: $\overline{AC} \cong \overline{CB}$

Prove: C is the midpoint of $\overline{AB}$

Proof: It is given that $\overline{AC} \cong \overline{CB}$. From the definition of congruent segments, $AC = CB$. By the definition of midpoint, C is the midpoint of $\overline{AB}$.