

Objective: You will learn to write proofs involving segment addition and congruence.

Recall:

Midpoint: Splits a segment into 2 congruent pieces.

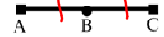
Segment Addition Postulate: If M is between A and C, then $AM + MC = AC$

Angle Addition Postulate: If R is in the interior of $\angle PQS$, then $m\angle PQR + m\angle RQS = m\angle PQS$

Nov 4-4:58 PM

Example 1: Given: B is the midpoint of \overline{AC} .

Prove: $AB = BC$



Statements	Justifications
1. B is the midpoint of \overline{AC}	1. Given
2. $\overline{AB} \cong \overline{BC}$	2. def. of midpt
3. $AB = BC$	3. def of \cong

Nov 4-5:00 PM

Example 2: Given: $XY = ZW$

Prove: $XZ = YW$



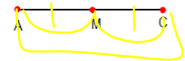
Statements	Justifications
1. $XY = ZW$	1. Given
2. $XY + YZ = YZ + ZW$	2. add prop
3. $XY + YZ = XZ$	3. Segment Addition Postulate
4. $YZ + ZW = YW$	4. S.A.P
5. $XZ = YW$	5. Substitution

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Example 3: Given: M is the midpoint of \overline{AC} ;

$AC = 10$

Prove: $AM = 5$

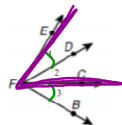


Statements	Justifications
1. M is the midpoint of AC, $AC = 10$	1. Given
2. $\overline{AM} \cong \overline{MC}$	2. def. of midpt
3. $AM = MC$	3. Definition of congruence
4. $AM + MC = AC$	4. S.A.P
5. $AM + AM = AC$	5. Substitution
6. $2AM = AC$	6. Substitution
7. $2AM = 10$	7. Substitution
8. $AM = 5$	8. division prop

Nov 4-5:05 PM

Example 4: Given: $m\angle 1 = m\angle 3$

Prove: $m\angle DFB = m\angle EFC$



Statements	Justifications
1. $m\angle 1 = m\angle 3$	1. Given
2. $m\angle DFB = m\angle 2 + m\angle 3$	2. AAP
3. $m\angle DFB = m\angle 2 + m\angle 1$	3. Substitution
4. $m\angle DFB = m\angle 1 + m\angle 2$	4. Commutative
5. $m\angle 1 + m\angle 2 = m\angle EFC$	5. AAP
6. $m\angle DFB = m\angle EFC$	6. transitive

Nov 4-5:07 PM

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