Geometry CC – Unit 5
Lesson 3: Proofs Using Definitions
M1 L22-27

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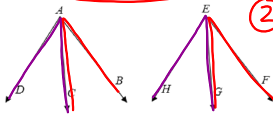
DO NOW:

Given: $\angle DAC \cong \angle HEG$
$\angle CAB \cong \angle GEF$

Prove: $\angle DAB \cong \angle HEF$



Statements	Reasons
① $\angle DAC \cong \angle HEG$; $\angle CAB \cong \angle GEF$	① Given
② ∡DAC + ∡BAC ≅ ∡HEG + ∡FEG; ∡DAB ≅ ∡HEF	② Addition Postulate

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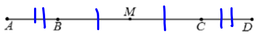
Set up a 'Statement/Reasons' table to prove the following:

1. Given: M is the midpoint of $\overline{BC}$.
$\overline{AB} \cong \overline{CD}$

Prove: $\overline{AM} \cong \overline{MD}$



S	R
① M is the midpoint of $\overline{BC}$; $\overline{AB} \cong \overline{CD}$	① Given
② $\overline{BM} \cong \overline{CM}$	② A midpoint ÷'s a segment into 2 ≅ segments
③ $\overline{AB} + \overline{BM} \cong \overline{MC} + \overline{CD}$; $\overline{AM} \cong \overline{MD}$	③ Addition Postulate

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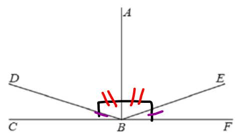
2. Given: $\overline{AB} \perp \overline{CF}$
$\angle DBC \cong \angle EBF$

Prove: $\angle DBA \cong \angle EBA$



S	R
① $\overline{AB} \perp \overline{CF}$; $\angle DBC \cong \angle EBF$	① Given
② ∡ABC & ∡ABF are right ∡'s	② ⊥ lines form Rt ∡'s
③ ∡ABC ≅ ∡ABF	③ all right ∡'s are ≅.
④ ∡ABC − ∡DBC ≅ ∡ABF − ∡EBF; ∡DBA ≅ ∡EBA	④ Subtraction Postulate

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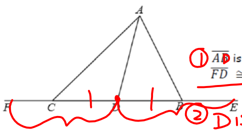
3. Given: $\overline{AB}$ is a median in $\triangle ABC$
$\overline{FD} \cong \overline{DE}$

Prove: $\overline{FC} \cong \overline{BE}$



S	R
① $\overline{AD}$ is a median in $\triangle ABC$; $\overline{FD} \cong \overline{DE}$	① Given
② D is a midpoint	② A median is a line segment drawn from a vertex to the midpt on the opp side
③ $\overline{CD} \cong \overline{BD}$	③ A midpoint ÷'s a seg into 2 ≅ segments.
④ $\overline{FD} - \overline{CD} \cong \overline{DE} - \overline{DB}$; $\overline{FC} \cong \overline{BE}$	④ Subtraction Postulate

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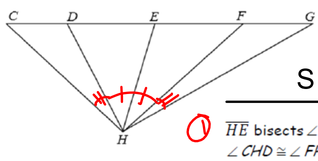
4. Given: $\overline{HE}$ bisects $\angle DHF$
$\angle CHD \cong \angle FHG$

Prove: $\angle CHE \cong \angle EHG$



S	R
① $\overline{HE}$ bisects $\angle DHF$; $\angle CHD \cong \angle FHG$	① Given
② ∡DHE ≅ ∡FHE	② an ∡ bisector ÷'s an ∡ into 2 ≅ ∡'s.
③ ∡CHD + ∡DHE ≅ ∡GHF + ∡FHE; ∡CHE ≅ ∡EHG	③ Addition Postulate

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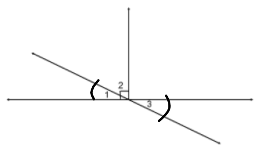
5. Given: $\angle 1$ and $\angle 2$ are complementary.

Prove: $\angle 2$ and $\angle 3$ are complementary.



Statements	Reasons
1. ∡1 & ∡2 are Complementary	1. Given
2. $m\angle 1 + m\angle 2 = 90°$	2. Complementary ∡'s Sum to 90°
3. $\measuredangle 1 \cong \measuredangle 3$	3. Vertical angles are congruent.
4. $m\angle 1 = m\angle 3$	4. Vertical ∡'s are = in measure
5. $\measuredangle 2 \cong \measuredangle 3$	5. Substitution Property
6. $\angle 2$ and $\angle 3$ are complementary.	6. Complementary ∡'s Sum to 90°

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