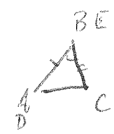
Math 45021 | Euclidean Geometry | Spring 2017
Quiz 1 | | Matt Alexander
Name: Key | | Quiz Score: ______ /20

1. Mark as true or false the following statements. Suppose $\triangle ABC$ and $\triangle DEF$ are such that:

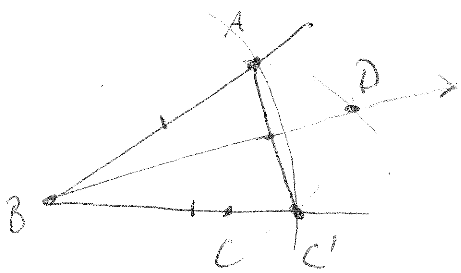


A) **T** F $\overline{AB} \cong \overline{DE}$, $\overline{BC} \cong \overline{EF}$, and $\angle B \cong \angle E$. This implies that $\triangle ABC \cong \triangle DEF$.

B) T **F** $\overline{AB} \cong \overline{DE}$, $\overline{BC} \cong \overline{EF}$, and $\angle C \cong \angle F$. This implies that $\triangle ABC \cong \triangle DEF$.

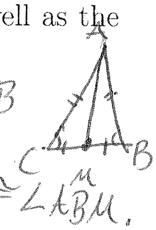
C) T **F** $\angle A \cong \angle D$, $\angle B \cong \angle E$, and $\angle C \cong \angle F$. This implies that $\triangle ABC \cong \triangle DEF$.

2. Construct the angle bisector to any angle $\angle ABC$.



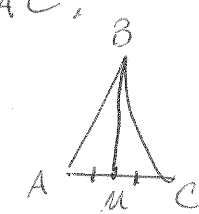
1) Create a circle of radius $\overline{BA}$ center[ed at B,]
call the intersection with $\overrightarrow{AC}$ C'
2) Create two circles of radius AC' center[ed]
at A & C', call the intersection on the
far side D.
3) $\overrightarrow{BD}$ is the angle bisector

3. Prove that the median to the base of an isosceles tirangle is the perpendicular bisector as well as the angle bisector of the angle opposite the base.



Let $\triangle ABC$ be any triangle and M the median of side $\overline{BC}$, $\angle C \cong \angle B$
Then by SAS $\triangle ACM \cong \triangle ABM$ so $\angle CAM \cong \angle BAM$ and $\angle CMA \cong \angle ABM$.
Hence $\overrightarrow{AM}$ is the angle bisector. Since M is on $\overleftrightarrow{CB}$ $\angle CMA + \angle BMA = 180$
hence $\angle CMA = \angle BMA = 90°$ and $\overrightarrow{AM}$ is the perp. bisector. ∎

4. Given a triangle $\triangle ABC$ and a median BM which splits the triangle into two triangles with equal perimeter, show that these two triangles are congruent.



Let $\triangle ABC$ be any triangle and M the midpoint of $\overline{AC}$.
Then $BM + AM + AB = BC + BM + MC$ by assumption.
Since $AM = MC$ & $BM = BM$ we have $AB = BC$.
Hence by SSS $\triangle AMB \cong \triangle CMB$. ∎