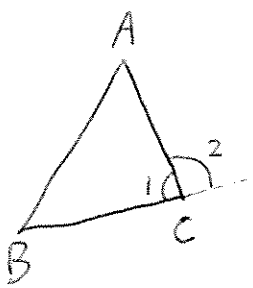
Math 372 Quiz 5 Total points: 10
Instructor: Yi Wang

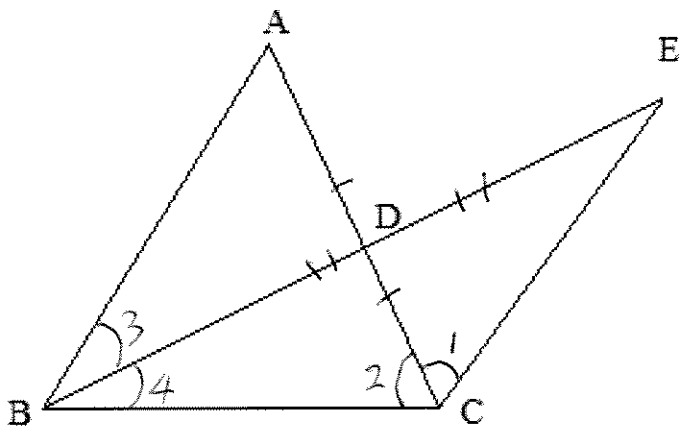
Name(Print)_____ Section_____ Grade_____

1. Use the Exterior Angle Inequality to prove the following statement: the sum of the measures of any two angles of a triangle is less than 180.



Let $\triangle ABC$ be given, without loss of generality, we will prove $m\angle 1 + m\angle A < 180$.
$m\angle 1 + m\angle 2 = 180$ by the linear pair theorem
$m\angle 2 > m\angle A$ by exterior angle inequality
So $m\angle 1 + m\angle A > 180$ ☑

2. In the following figure, D is the midpoint of $\overline{AC}$ and $\overline{BE}$ as well. Show that the angle sum of ΔABC equals to the angle sum of ΔEBC.



proof:
Since D is the midpoint of $\overline{AC}$ and $\overline{BE}$,
$AD = CD$ and $BD = ED$
So $\triangle ABD \cong \triangle CED$ by SAS. It follows that $\angle A \cong \angle 1$ and $\angle E \cong \angle 3$.
~~$m\angle A$~~ + the angle sum of $\triangle ABC = m\angle A + m\angle 3 + m\angle 4 + m\angle 2$
~~the angle su~~
$= m\angle 1 + m\angle E + m\angle 4 + m\angle 2$
= the angle sum of $\triangle EBC$
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