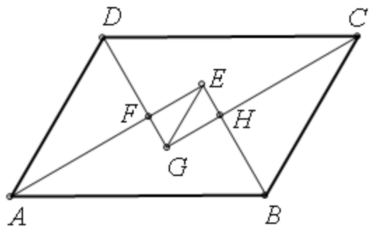
Example 43 : As shown in Figure 7, in $\angle A$ the parallelogram $ABCD$, $\angle B$ the angle bisector of sum intersects at point E, $\angle C$ and $\angle D$ the angle bisector of sum intersects at point G. Prove: $EG // BC$.

Proof: Let $\overrightarrow{AB}$ the unit vector be $\vec{a}$, $\overrightarrow{AD}$ and the unit vector be $\vec{b}$, then $\overrightarrow{AE} = m(\vec{a}+\vec{b})$, $\overrightarrow{BE} = n(-\vec{a}+\vec{b})$, $\overrightarrow{CG} = -p(\vec{a}+\vec{b})$, $\overrightarrow{DG} = q(\vec{a}-\vec{b})$; from $\overrightarrow{AB} = \overrightarrow{DC}$, $\overrightarrow{AE}+\overrightarrow{EB} = \overrightarrow{DG}+\overrightarrow{GC}$ that is $m(\vec{a}+\vec{b})-n(-\vec{a}+\vec{b}) = q(\vec{a}-\vec{b})+p(\vec{a}+\vec{b})$, $m+n=p+q$, $m-n=p-q$ and get $m=p$, $n=q$. By $\overrightarrow{AE} = \overrightarrow{AB}+\overrightarrow{BE}$, that is $m(\vec{a}+\vec{b}) = k\vec{a}+n(-\vec{a}+\vec{b})$, solved $m=n$. Thus $\overrightarrow{EG} = \overrightarrow{EB}+\overrightarrow{BC}+\overrightarrow{CG} = -m(-\vec{a}+\vec{b})+\overrightarrow{BC}-m(\vec{a}+\vec{b}) = \overrightarrow{BC}-2m\vec{b}$, so $EG // BC$.



$$2\frac{E-G}{B-C}+\frac{\frac{A-E}{A-B}}{\frac{B-C}{A-E}}+\frac{\frac{B-E}{B-C}}{\frac{B-A}{B-E}}+\frac{\frac{C-G}{B-A}}{\frac{C-B}{C-G}}+\frac{\frac{A+C-B-G}{C-B}}{\frac{A-B}{A+C-B-G}}=2,$$