Problem of the Week
Problem E
Maybe One-Third?

In the diagram, square $OABC$ is positioned with $O$ at the origin $(0,0)$, $A$ on the positive $y$-axis, $C$ on the positive $x$-axis, and $B$ in the first quadrant. Side $OA$ is trisected by points $F$ and $G$ so that $OF = FG = GA = 100$. Side $OC$ is trisected by points $D$ and $E$ so that $OD = DE = EC = 100$. Line segment $BE$ intersects line segment $CF$ at $H$.

If the interiors of $\triangle BHF$ and $\triangle CHE$ are both shaded, then what fraction of the total area of the square is shaded?