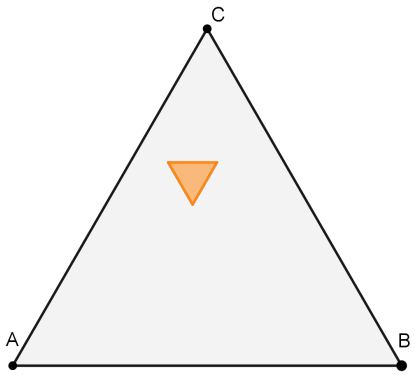
UNIVERSITY OF WISCONSIN
PLATTEVILLE
DEPARTMENT OF MATHEMATICS

Problem of the Week #9

(Spring 2022)

Let $\triangle ABC$ be an equilateral triangle with sides of length L. A "downward triangle" is an equilateral triangle with sides of length 1, having edges parallel to the edges of $\triangle ABC$, but with the opposite orientation, as shown in the figure.
Prove: If n downward triangles can fit inside $\triangle ABC$, without overlapping except along edges, then $n \leq \frac{2}{3}L^2$.



[Please fully explain your answer.]

Email solutions to `kwonmi@uwplatt.edu` by 2:00pm on Wednesday, April 6, 2022.

Every week, the best solution submitted earns a $10 Platteville gift certificate; the top scorer each semester also wins a cash award. Good luck!
You can always see the Problem of the Week (and complete rules) online at:

`http://uwpmath.weebly.com/`