## Proof Without Words: New Pythagorean-like Theorems

Claudi Alsina, Universitat Politècnica de Catalunya, 08028 Barcelona, Spain,
and Roger B. Nelsen, Lewis & Clark College, Portland, OR 97219

Let $T$ denote the area of a triangle with angles $\alpha$, $\beta$, and $\gamma$, and construct equilateral triangles with area $T_\alpha$, $T_\beta$, and $T_\gamma$, externally on the sides opposite $\alpha$, $\beta$, and $\gamma$, respectively. In the March 2003 issue of this JOURNAL there appeared a wordless proof that $\alpha = \pi/3$ implies $T_\alpha + T = T_\beta + T_\gamma$ [1]; and in the May 2004 issue a wordless proof that $\alpha = 2\pi/3$ implies $T_\alpha = T_\beta + T_\gamma + T$ [2]. Here are wordless proofs of two additional Pythagorean-like theorems:

    (a) $\alpha = \pi/6$ implies $T_\alpha + 3T = T_\beta + T_\gamma$; and

    (b) $\alpha = 5\pi/6$ implies $T_\alpha = T_\beta + T_\gamma + 3T$.
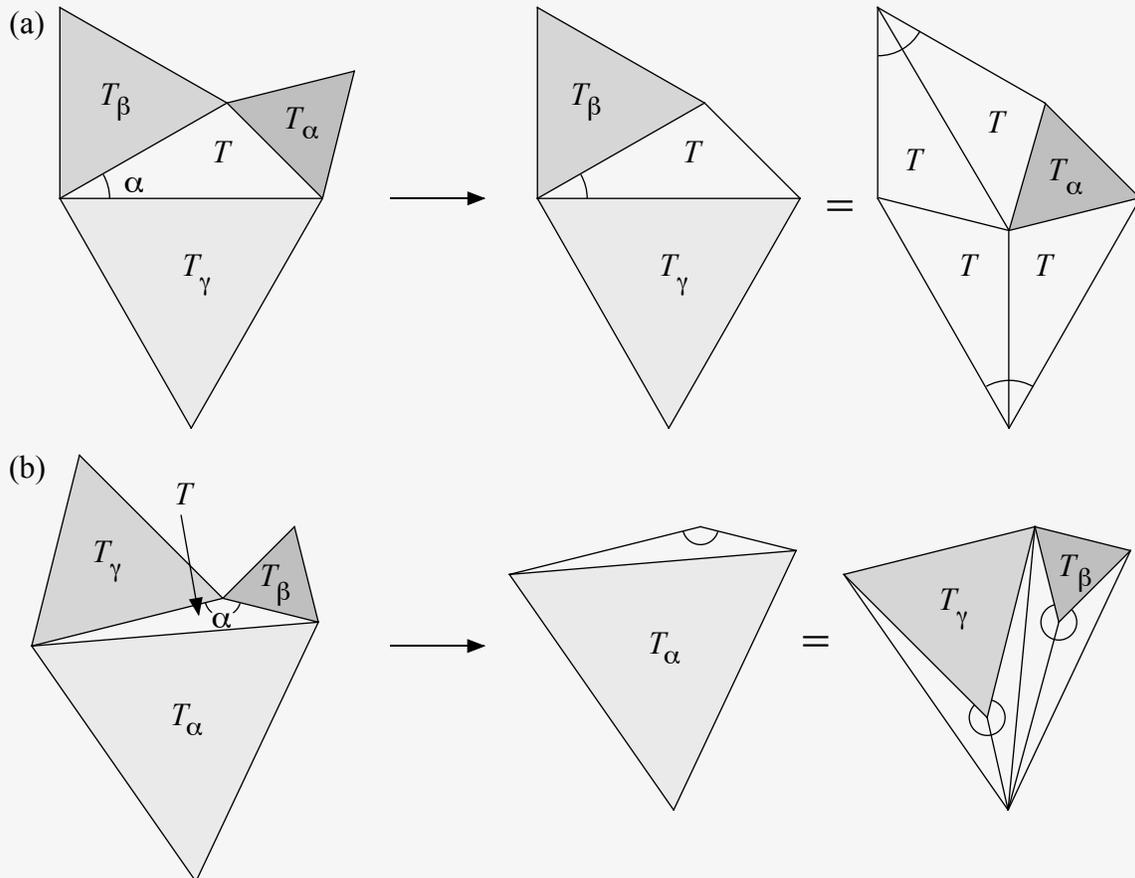


## References

1. M. Moran Cabre, Mathematics without words, *College Math. J.* 34 (2003) 172.
2. R. B. Nelsen, Mathematics without words, *College Math. J.* 35 (2004), 215.