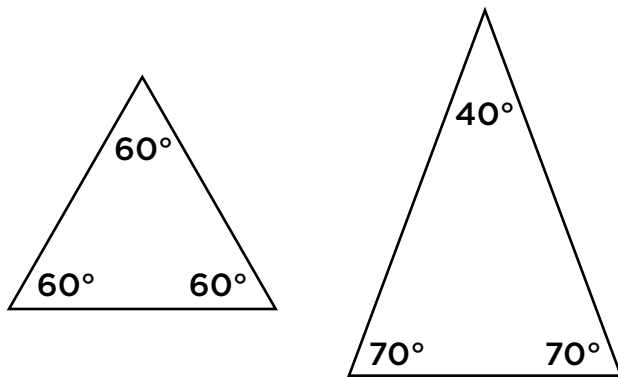


Your students will need to come up with a rule that will tell us how any attempt at drawing an equilateral triangle ranks against any other. Throughout their attempt they may use the resources provided (sides, areas, angles, and coordinates) but come up with a rule that doesn't hold up for every case.

Ask them to test their rule against lots of different cases. Their rule will have to work with cases that are very large or really small. If they are still convinced their rule works, you may want to suggest cases.

For instance, if the student suggests we find the sum of the differences between the angles of the contestants' triangles and 60° [ie. if a triangle has angles 64° , 58° , and 58° , the score would be $(60^\circ - 64^\circ) + (60^\circ - 58^\circ) + (60^\circ - 58^\circ) = 0^\circ$], offer the student these two examples, both of which score 0.



The best solution is to use the fact that an equilateral triangle is the triangle that encloses the most area for a given perimeter. Take Andrew's triangle, for instance. His area is $4,825 \text{ un}^2$. His perimeter is 319 un . An equilateral triangle with that perimeter would have each side equal to 106.3 un . The area of that equilateral triangle is $4,905 \text{ un}^2$. We can take a ratio of *what his triangle area was* to *what his triangle area should have been* and get a score. The closer to 1 (where *what was* and *what should have been* are the same) the better.

Rank	Name	guess		best		score
		perimeter	area	side length	area	
1	Timon	1,155	64,170	385	64,175	99.99%
2	Nathan	463	10,250	154	10,313	99.38%
3	Andrew	319	4,825	106	4,905	98.36%
4	Chris	803	30,530	268	31,054	98.31%