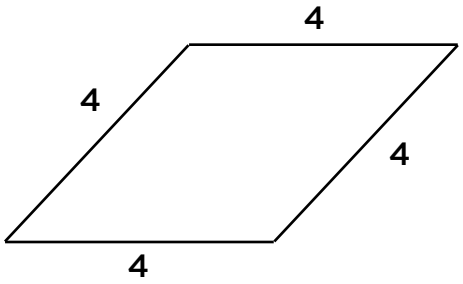
Your students will need to come up with a rule that will tell us how any attempt at drawing a square ranks against any other. Throughout their attempt they may use the resources provided (sides, areas, angles, and coordinates) but come up with a rule that doesn't hold up for every case.

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 look for quadrilaterals whose angles are all 90°, point out that rectangles have angles that are all 90°.

Or if the student suggests we look for quadrilaterals with all sides congruent to each other, point out that rhombi have congruent sides.



The best solution is to use the fact that a square is the quadrilateral that encloses the most area for a given perimeter. Take Timon's quadrilateral, for instance. His area is 156,862 un^2. His perimeter is 1,585 un. A square with that perimeter would have each side equal to 396.3 un. The area of that square would be 157,014 un^2. We can take a ratio of *what his quadrilateral area was* to *what his area should have been with a square* and get a score. The closer to 1 (where *what was* and *what should have been* are the same) the better.

		guess		best		
Rank	Name	perimeter	area	side length	area	score
1	Timon	1,585.1	156,861.5	396.3	157,035.2	99.89%
2	Chris	968.1	58,452.0	242.0	58,578.7	99.78%
3	Andrew	410.1	10,478.0	102.5	10,511.1	99.69%
4	Nathan	456.5	12,955.5	114.1	13,025.2	99.46%