

VECTEN

A surprising "area" challenge

- 5m40: create...two-dimensional shapes with the same perimeter or the same area
- Using *The Geometer's Sketchpad*
- Based on an activity from <http://nrich.maths.org/>

First Steps: Build a Vecten

1. Sketch a triangle and construct its interior; give the interior a bright color (see fig. 1)
2. Build three squares—each square uses one side of the triangle as its base (see fig. 2)
3. Join the outer vertices of the squares to make three new triangles (see fig. 3)
4. Construct an interior for each of the three new triangles; color each triangle interior differently from all the others (not the squares).

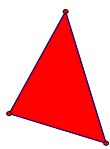


fig. 1

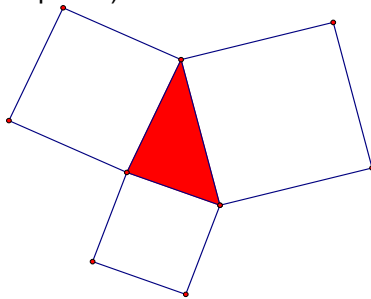


fig. 2

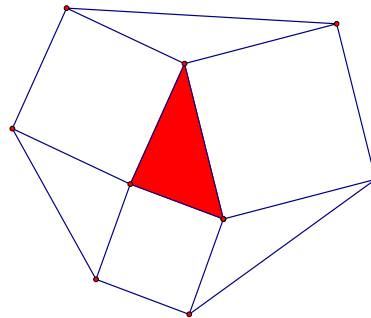


fig. 3

Next: Investigate Areas

5. Select the interior of the first triangle you made
6. Measure its area (Measure > Area)
7. De-select the triangle
8. Repeat these steps for the other three triangles you coloured
9. Use a text box to write what you observed and discovered

The big question is:

Is it possible to have different-looking shapes that have equal areas?

Now: Kick it Up a Notch!

10. Construct squares using the bases of the three outer triangles for the sides
11. Join the outer vertices of these squares: they will make three quadrilaterals (shown colored purple in fig. 4, right)
12. Construct and color interiors for these three quadrilaterals
13. Measure the areas of these quadrilaterals
14. Use a text box to write what you observed and discovered

To the moon!

15. Use the three quadrilaterals to make three new squares attached to them
16. Join the outer vertices of the new squares to make three new quadrilaterals
17. Measure the areas of these new quadrilaterals
18. Use a text box to write what you observed and discovered
19. Repeat this pattern and record your observations

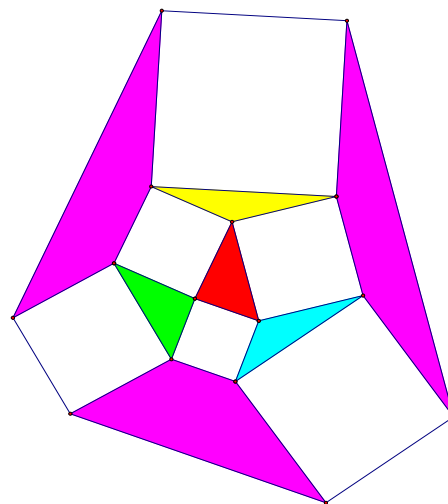


figure 4



Be sure to save your work before printing it.