

December 30th

A square, regular hexagon and an equilateral triangle all have the same perimeter.

Find which polygon has the greatest area.

The largest area that can be surrounded by a given perimeter is a circle, so it follows that the more sides of the polygon, the closer you are to the maximum area. Hence, the **hexagon** will have the largest area:

If the perimeter of each is 12:

Square:

Side length 3 Area $3^2 = 9$

Triangle:

Side length 4 Area $\frac{1}{2} \times 4 \times 4 \times \sin 60 = 6.93$

Hexagon:

Side Length 2 Area $6 \times \frac{1}{2} \times 2 \times 2 \times \sin 60 = 10.39$

(The circle with circumference 12, has area 11.46)