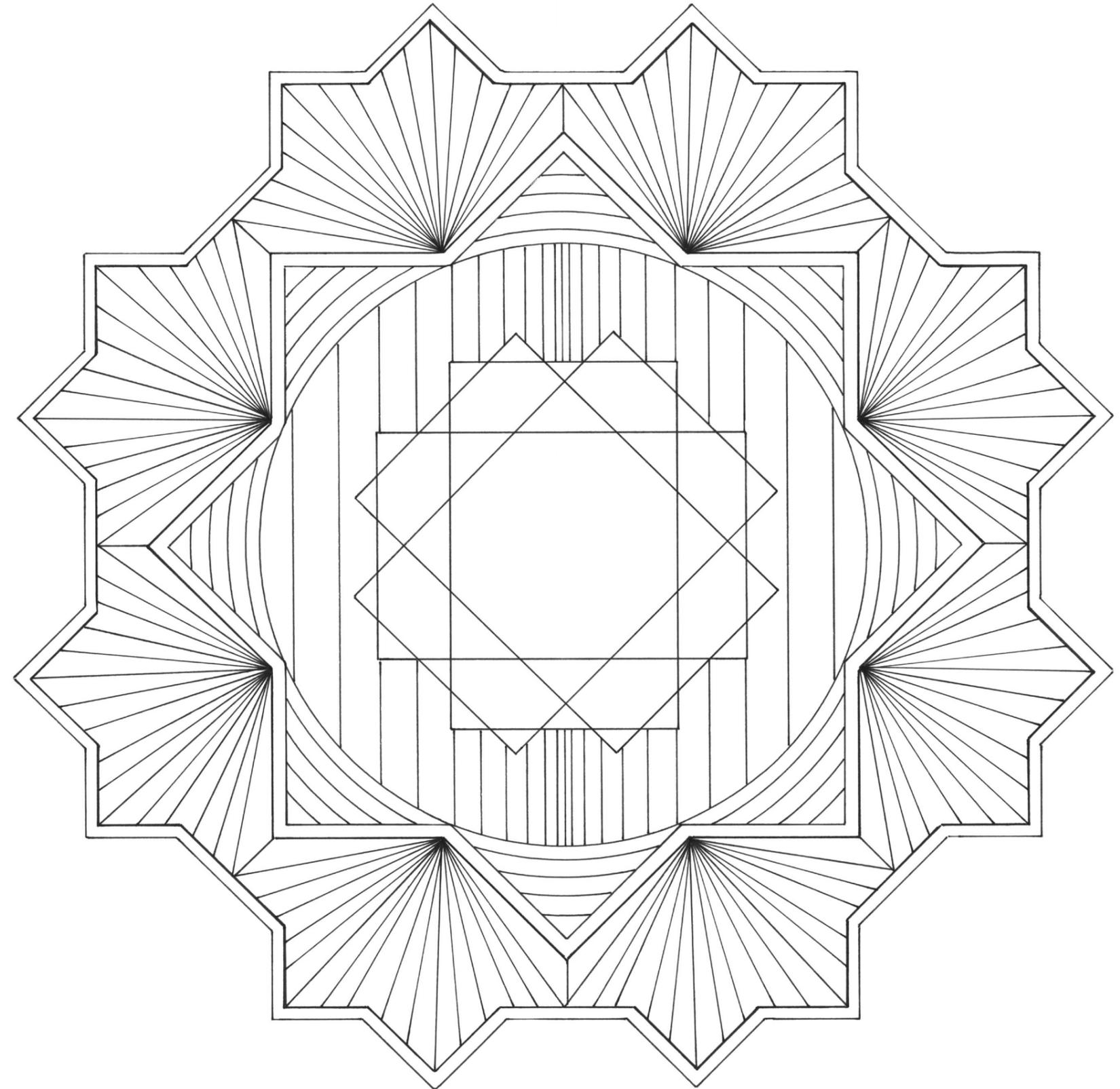
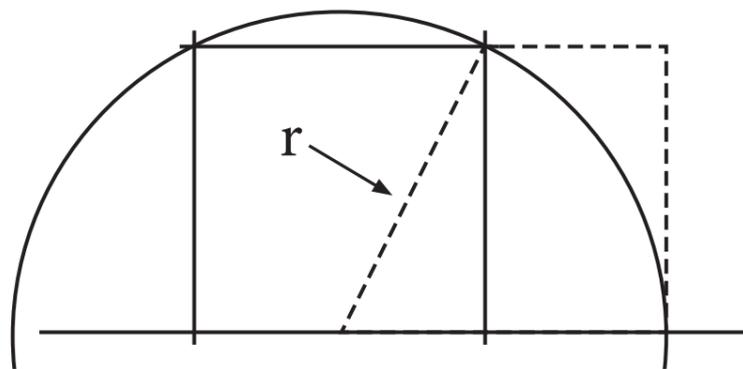


WHAT IS THE GOLDEN RATIO?

Phi is the irrational number (approximately 1.618) which we represent using the symbol Φ . It can be derived from a geometric quality – if we divide a line length x into two sections of lengths y and z , so that the ratio $x:y$ is the same as the ratio $y:z$, then each of these ratios is equal to phi. Phi is also known as the golden ratio, the golden mean or the divine proportion.

Alternatively, if we construct a rectangle using the method below, the ratio between the width and height of the rectangle is phi. This 'golden rectangle' has historically been seen as one of special beauty – many architects and painters have incorporated it in their work. It can, for instance, be observed in buildings as varied as the Parthenon, Notre Dame cathedral and the Taj Mahal. It is also the basis of the image opposite, which radiates out from four central interlocking golden rectangles.



THE FIBONACCI SPIRAL

The Fibonacci series is named after the brilliant medieval Italian mathematician, also known as Leonardo of Pisa, who popularized an idea already known to earlier Indian thinkers. It starts with 0 and 1 (or 1 and 1), then at each stage we add the previous two numbers in the series to find the next one: 1, 1, 2, 3, 5, 8, 13, 21, 34 ... The ratio between consecutive numbers in the Fibonacci series approaches phi – the golden ratio – as they become increasingly large.

By connecting the corners of the squares in a Fibonacci tiling, constructed, as below, from consecutive Fibonacci numbers, you can create a Fibonacci spiral (which is very similar to the smoother logarithmic spiral). This pattern is (approximately) replicated in an astonishing variety of natural phenomena, from nautilus shells, pine cones and sunflower seeds, to weather patterns and even solar systems.

