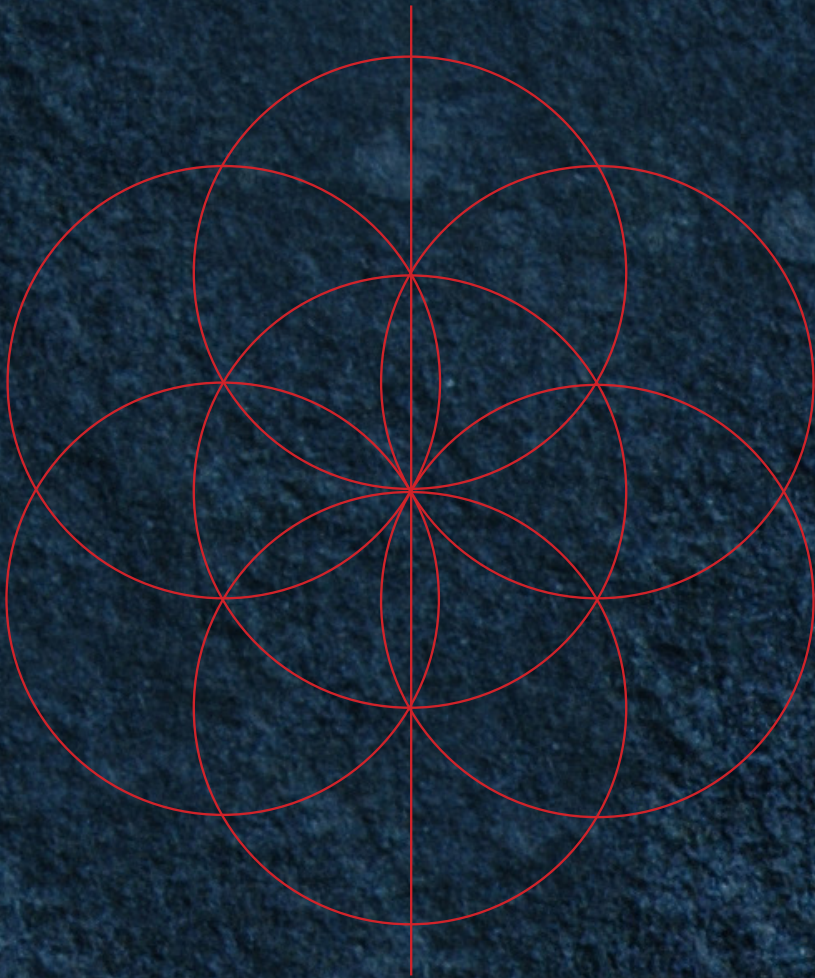


Drawing the **Daisy Wheel**
4 point **R**ectangle,
6 point **R**ectangle,
Square and **D**ouble **S**quare

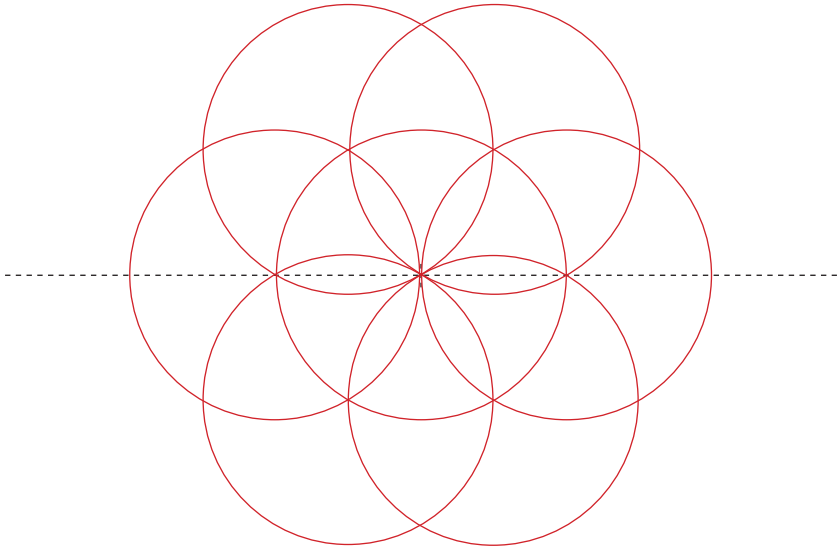


Laurie **S**MITH
HISTORIC **BUILDING** GEOMETRY

Laurie Smith is an independent early-building design researcher, specialising in geometrical design systems. Because geometry was part of the medieval educational curriculum he uses geometrical analysis to excavate and recover the design methodologies of the past, a process he thinks of as design archaeology. He lectures, writes and runs practical workshops on geometrical design and publishes his work through his website THEGEOMETRICALDESIGNWORKS.

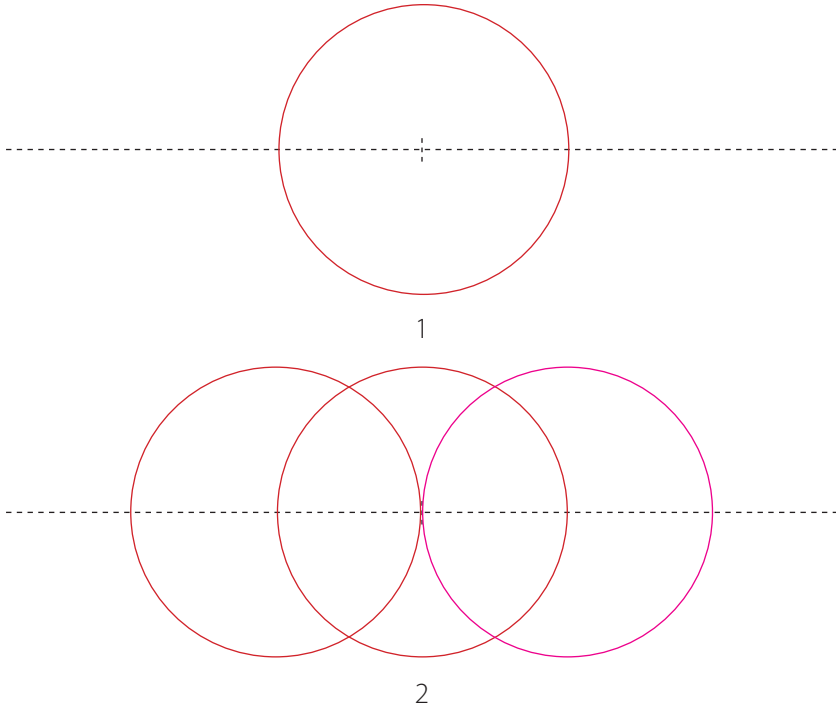
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THEGEOMETRICALDESIGNWORKS



Drawing the Daisy Wheel, 4 point Rectangle, 6 point Rectangle, Square and Double Square

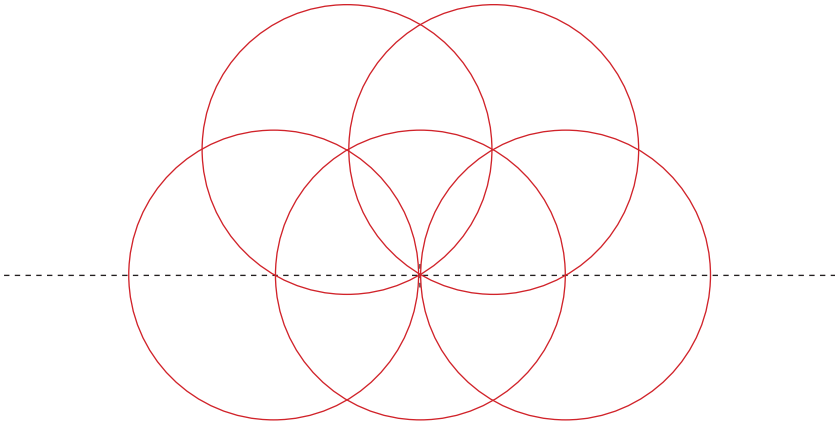
The simplest and most accurate way to draw a number of precision rectangular forms is through compass geometries such as the familiar Daisy Wheel, drawn by generations of school-children. Though this is often counter-intuitive to the modern mind (which is indoctrinated with the need for protractors, T squares, rulers and other drawing aids) using a compass eliminates the need for measurements or calculations and is a faster and more accurate drawing technique.



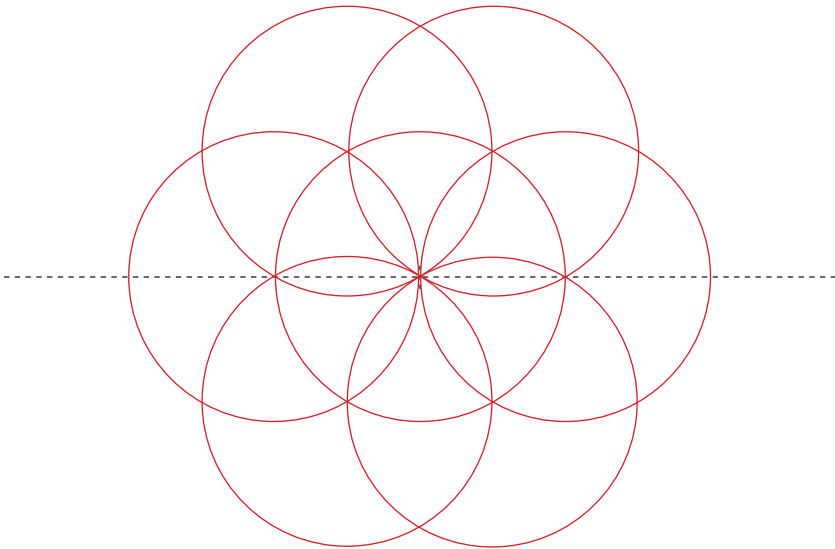
Drawing the Daisy Wheel

The common way to draw a daisy wheel is to draw the first circle, then six further circles around its circumference, seven circles in all. From the vantage point of experience, this is the worst way to draw the daisy wheel because drawing six circles around another circle's circumference multiplies any drawing error by six. The method described here diminishes error by introducing greater precision.

- 1 Draw a horizontal (or vertical) centre line.
Mark precisely the line's centre and draw the first circle from this point. The radius of the first circle is the only dimension needed for the remainder of the constructions. The first circle cuts the centre line at two points and these are the centres for circles two and three.
- 2 Using the radius of circle one, draw circles two and three. It can be seen that drawing on a centre line brings precision into the placing of the circles.
- 3 The central circle is cut by the outer circles at four points and these are the centres for circles four, five, six and seven. Two of the points are above the centre line and two are below.



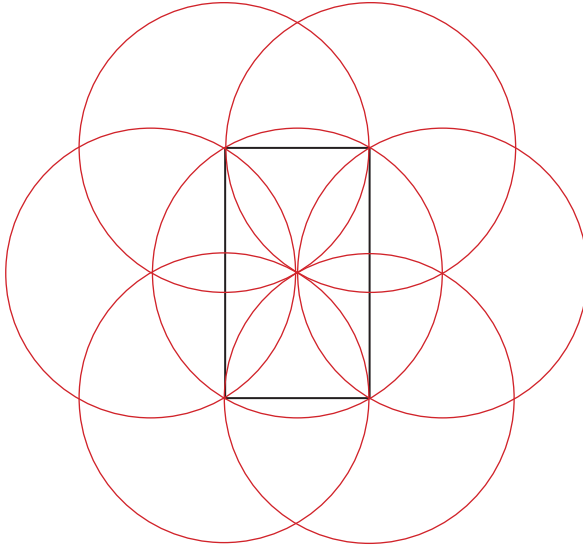
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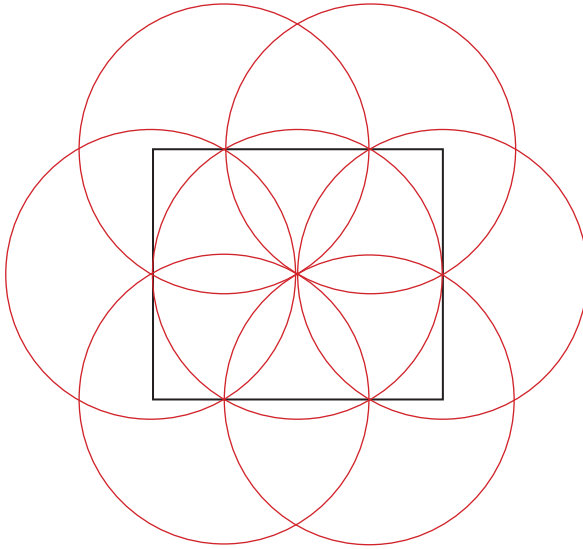
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- 5 Draw circles four and five from the two intersections above the centre line.
- 6 Draw circles six and seven from the two intersections below the centre line to complete the Daisy Wheel.

Once the drawing is complete the familiar daisy petal pattern is apparent within the central circle. The axis of the central circle and the six points where the petals kiss its circumference are critical points in the rectangular constructions that follow.



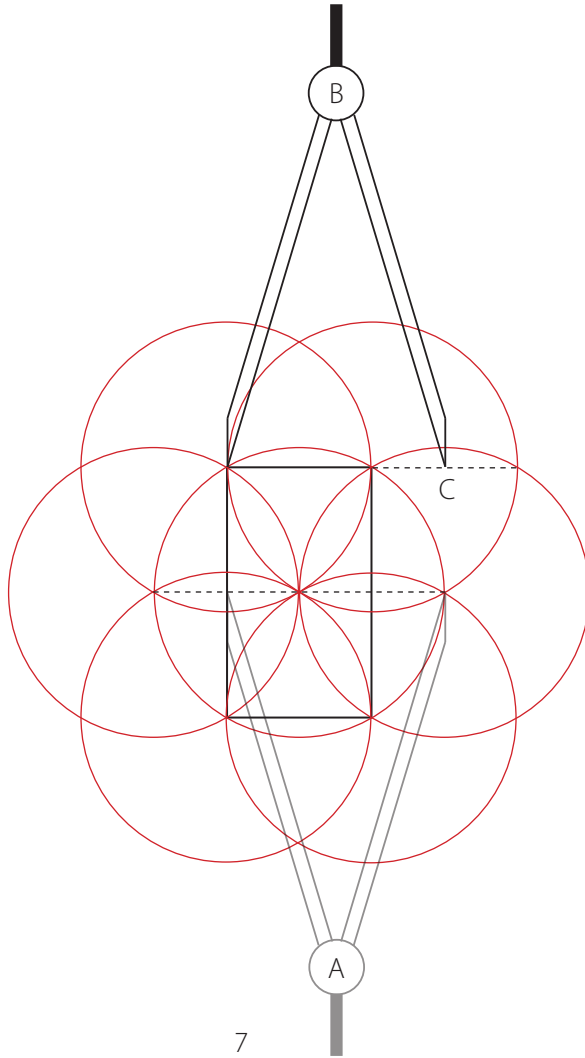
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6

Drawing the 4 point and 6 point Rectangles

- 5 Using a straight edge to link the wheel's petal tips, draw lines connecting the upper and lower pairs of points horizontally and vertically to form the 4 point rectangle.
- 6 Using dividers (see next page), extend the 4 point rectangle to the remaining two petal tips to form the 6 point rectangle. The 6 point rectangle is exactly twice the area of the 4 point rectangle.



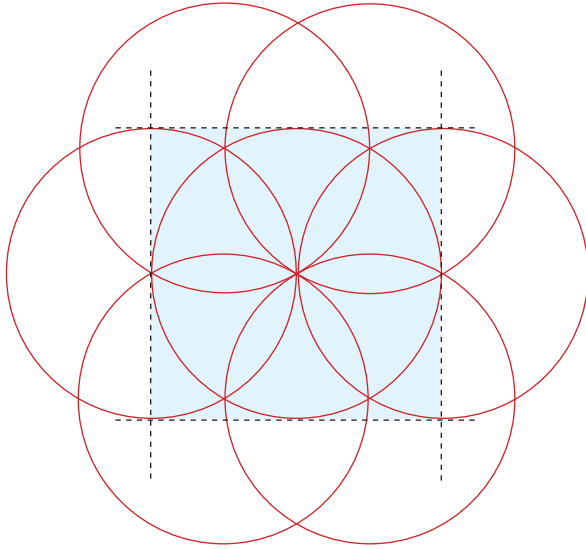
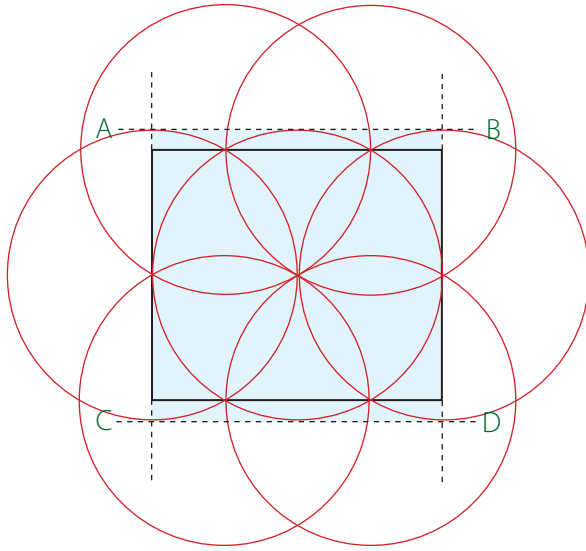
Using dividers to transmit dimensions

- Using a straight edge to link the wheel's central petal tips, draw a line to connect them.

Take a divider reading as shown with the dividers in position A, place them in position B and mark the point where the divider cuts the line at point C.

Repeat this for the remaining three corners of the rectangle and then use a straight edge to link the points.

Taking divider (or compass) readings is fast, precise and eliminates the need to take measurements.

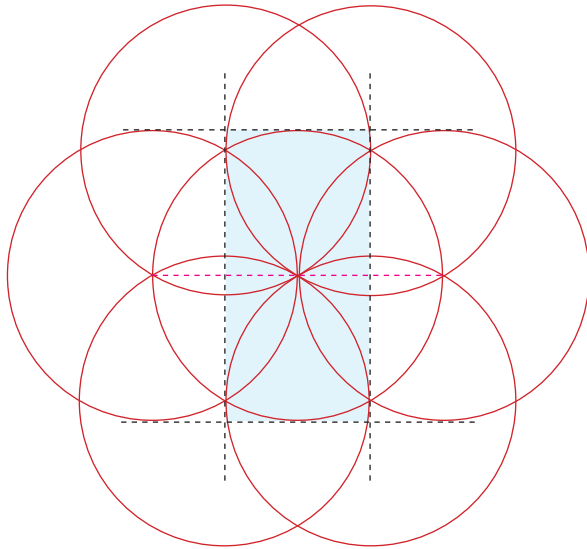
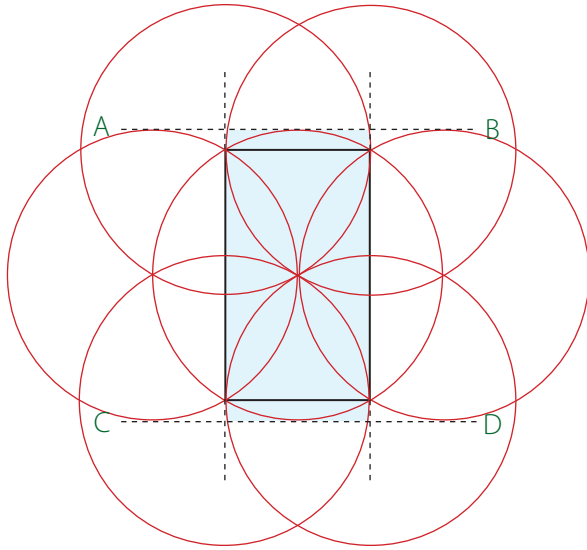


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Drawing the Square (shown in blue tone)

- 8 Using a straight edge draw lines AB and CD as tangents to the three central circles. Extend the rectangle's vertical sides to meet the tangents.

The square fits exactly around the daisy wheel's central circle.



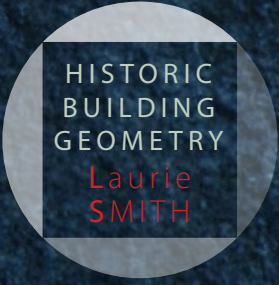
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Drawing the Double Square (shown in blue tone)

- Using a straight edge draw lines AB and CD as tangents to the three central circles. Extend the rectangle's vertical sides to meet the tangents.

The double square is exactly half the area of the full square.

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A circular logo with a dark blue background. Inside the circle is a white square containing the text "HISTORIC BUILDING GEOMETRY" in black, stacked vertically. Below this, the name "Laurie SMITH" is written in red, with "Laurie" on one line and "SMITH" on the line below.

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Laurie
SMITH