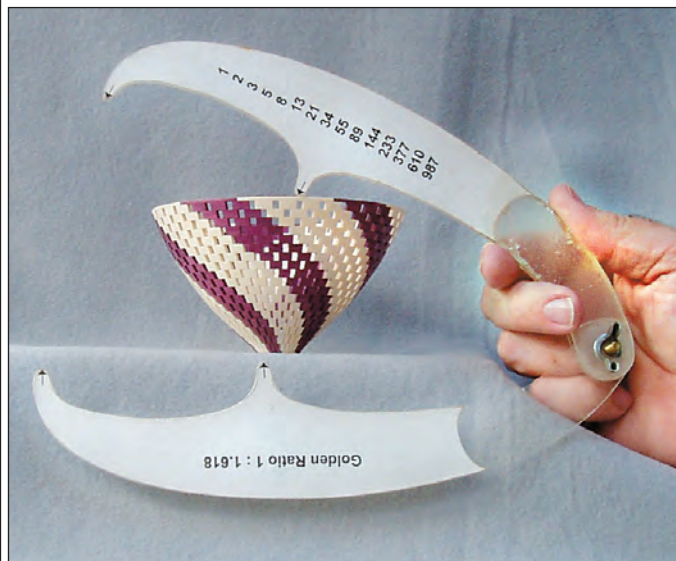


Golden Dividers

New tool, ancient roots

By Bill Smith



Put your Golden Dividers to work

As shown in the photos above, this 2 $\frac{3}{4}$ " x 4 $\frac{1}{2}$ " bowl follows the 1:1.618 Golden Mean formula. The 4 $\frac{1}{2}$ " width (top photo) matches the Golden Mean for the height (bottom photo).

Mathematicians, philosophers, and scientists studied it. Architects and engineers relied on it from ancient times to present day. Even Mother Nature likes it. And certainly all self-respecting artists—woodturners included—incorporate it in some form in a portion of their work.

I'm talking about the Golden Mean, that seemingly magical ratio of width to height that appeals to the eyes of so many.

Using the full-size patterns shown *opposite*, you can easily incorporate the Golden Mean into your woodturning designs and see the correct 1:1.618 ratio at a glance.

Make your own dividers

The attached drawing was designed for turnings up to about 8". To make a larger set of dividers, scale up the drawings with an enlarging copy machine.

First, make a photocopy of the patterns. Using a spray adhesive (3M no. 77 adhesive works well), attach the patterns to a piece of 1/8"-thick acrylic plastic, metal, or another suitable substrate.

Cut out along the pattern lines with a scrollsaw or bandsaw. Be careful at the tips of the four arrows as they delineate the ratio—you want the divider profiles to just touch the arrow tips. (I hand-sand this area.) To protect the paper, apply two or three coats of clear sealer such as Deft or Krylon.

Then drill a $\frac{5}{32}$ "-diameter hole for a #8x1/2" panhead machine screw and wing nut. To get an accurate set of dividers, you must drill carefully at the point marked with an "X." After assembly, the ultimate test is to close the dividers—the arrow tips should just touch.

Bill Smith (k3lf@aol.com) is a woodturner from Doylestown, Pennsylvania. He will demonstrate segmented turnings at the Overland Park symposium.

1:1.618: Golden for 8 centuries

The ancients probably adopted the 1:1.618 ratio because it made things look good. In the thirteenth century, Italian mathematician Leonardo Fibonacci recognized a series of numbers that is now known as the Fibonacci series. As it turns out, if you divide any Fibonacci number by the previous number you get a close approximation of the Golden Mean. The series may be calculated by adding the previous number to the current number to get the next number ($1 + 2 = 3$, $2 + 3 = 5$, $3 + 5 = 8$ and so forth).

The Golden Mean has several uses in woodturning:

- While turning an object, adjust the height to the diameter.
- Divide a turning so that the lower section is 1.618 times the height of the top section.
- Divide a lidded box from top to bottom by the Golden Mean (the longer dimension is usually on the bottom).

The Golden Mean—while useful—is only a guide to one set of height and diameter ratios. If you rely on it too frequently your work will probably become boring. (At best, the Golden Mean figures into less than 20 percent of my own work.) There are many other shapes and ratios that work well. It is most important to make turnings that look good to your eye and have shapes that feel good to your touch.

Golden Ratio 1:1.618

Divide any Fibonacci number by the previous number

Calipers designed by Bill Smith
For non-commercial use only.

1.618 Units → ← 1.618 Units

Arrows indicate the optimal point of contact for an exact ratio when making measurements. When closed, the arrow points should just meet. The length from the pivot point to the first arrows, compared to the length from the pivot point to the second arrows forms a ratio of 1:1.618 and any calipers laid out in this ratio will work.

1 Unit → ← 1 Unit

Fibonacci number series under 1,000.
Add any number to the previous number to get the next number.

1
2
3
5
8
13
21
34
55
89
144
233
377
610
987