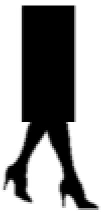
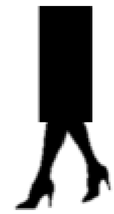


The Golden Ratio: Overview

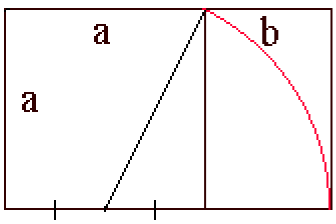
presented by Garrison Benson



$$\frac{1 \pm \sqrt{5}}{2}$$

$$\frac{1+\sqrt{5}}{2} = 1.61803399 = \varnothing = Phi \qquad \frac{1-\sqrt{5}}{2} = 0.61803399 = \phi = phi$$

(Note that $\phi = \frac{1}{\varnothing}$ and $\phi = \varnothing - 1$.)



The following is true of a rectangle if and only if it is a Golden Rectangle:

$$\frac{a}{b} = \frac{a+b}{a}$$

Thus, to find the Golden Ratio, we can substitute 1 in for *b* (we could also use *a* if we wanted) and solve for *a*. After some funtastic algebra, this will give us:

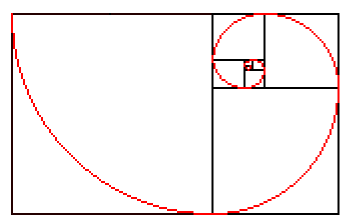
$$a^2 - a - 1 = 0$$

Now we can plug this in to the Quadratic Formula (oh boy!) and solve for our Golden Ratio:

$$-b \pm \frac{\sqrt{b^2 - 4ac}}{2a}$$

$$\frac{-(-1) \pm \sqrt{(-1)^2 - 4(1)(-1)}}{2(1)}$$

$$\frac{1 \pm \sqrt{5}}{2}$$



More fun stuff to think about:

Note the Fibonacci numbers!

$$\varnothing^2 = \varnothing + 1$$
$$\varnothing^3 = 2\varnothing + 1$$
$$\varnothing^4 = 3\varnothing + 2$$
$$\varnothing^5 = 5\varnothing + 3$$
$$\varnothing^6 = 8\varnothing + 5$$

etc.

$$\varnothing = 1 + \cfrac{1}{1 + \cfrac{1}{1 + \cfrac{1}{1 + \cfrac{1}{1 + \cfrac{1}{\cdots}}}}}$$

$$\varnothing = 1 + \frac{1}{(1*1)} - \frac{1}{(1*2)} + \frac{1}{(2*3)} - \frac{1}{(3*5)} \cdots$$

$\frac{1}{1} = 1$ $\quad \frac{1}{2} = .5$ $\quad \frac{2}{3} = .667$ $\quad \frac{3}{5} = .6$ $\quad \frac{5}{8} = .625$ $\quad \frac{8}{13} = .615$ $\quad \frac{13}{21} = .619$ $\quad \frac{21}{34} = .618$ etc.

The Golden Rectangle on the eWeb:

http://www.jimloy.com/geometry/golden.htm
http://mathworld.wolfram.com/GoldenRectangle.html
http://www.mcs.surrey.ac.uk/Personal/R.Knott/Fibonacci/fibInArt.html